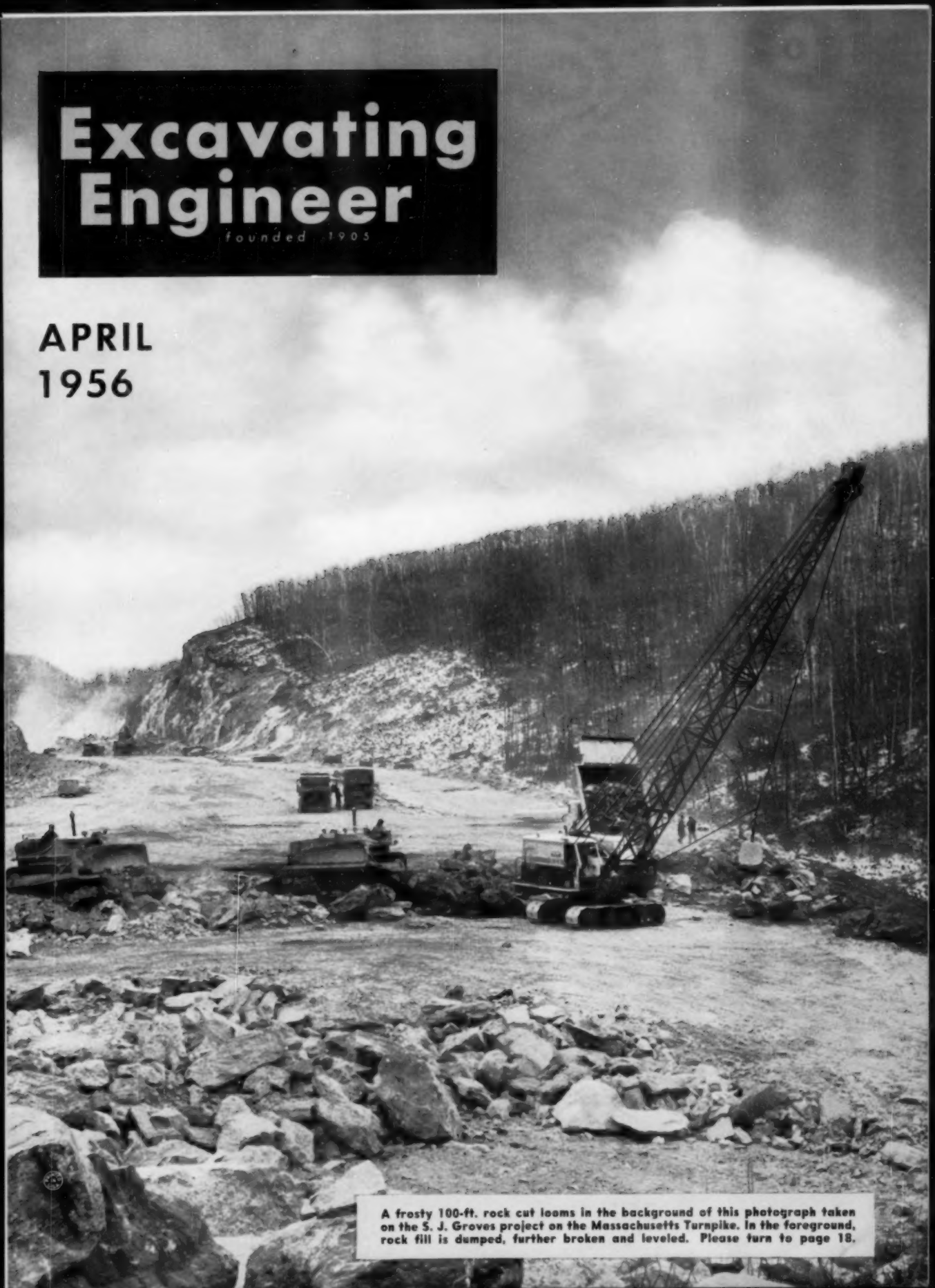
Excavating Engineer

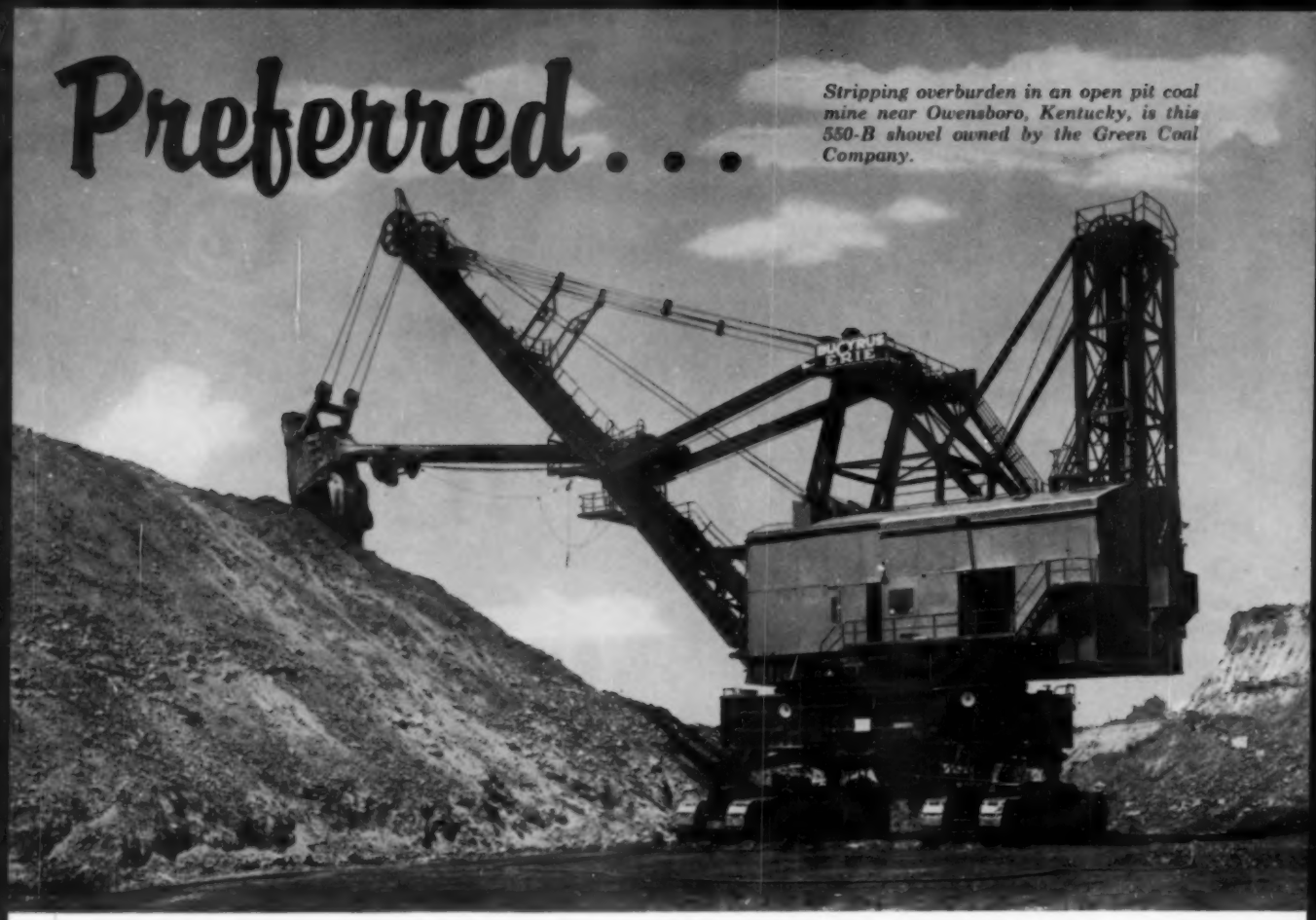
founded 1905

APRIL
1956



A frosty 100-ft. rock cut looms in the background of this photograph taken on the S. J. Groves project on the Massachusetts Turnpike. In the foreground, rock fill is dumped, further broken and leveled. Please turn to page 18.

Preferred . . .



Stripping overburden in an open pit coal mine near Owensboro, Kentucky, is this 550-B shovel owned by the Green Coal Company.

FOR ECONOMICAL, BIG-VOLUME STRIPPING

It is dependable high output that makes Bucyrus-Erie stripping shovels and draglines first choice wherever high overburden ratios threaten economical coal recovery. Their range, capacity, speed and reliability come from sound design and durable construction made possible by Bucyrus-Erie's unequalled experience in building excavating machinery of all sizes and types.

Records show that most of the major output-increasing developments in coal stripping equipment have been introduced by Bucyrus-Erie. Today the popularity of its stripping shovels and walking draglines is good indication that leadership has been maintained. Get the full details from those who know — owners and operators themselves — and find out how Bucyrus-Eries can set new production records on your stripping jobs. 70155C

BUCYRUS ERIE

South Milwaukee
Wisconsin

75 YEARS OF SERVICE
to Men Who
Shape the Earth

Dart 140-TC truck with Allis-Chalmers 8DAS-1125 supercharged diesel being loaded by a shovel powered by an Allis-Chalmers 6DCS-1879 supercharged diesel.

Fifty-five ton Dart truck powered by Allis-Chalmers 8DAS-1125 supercharged diesel dumping over edge of spoil bank that is approximately 500 ft high.

DIESEL ENGINES AVERAGE 5,000 HOURS BEFORE OVERHAULS

Allis-Chalmers Buda Division truck engines powering 24 Dart and Euclid trucks help keep production flowing smoothly at the Bagdad Copper Corp. mine under extremely demanding conditions. These trucks work two shifts a day, six days a week, hauling out both overburden and ore. The haul covers about 7/10 mile, up a grade which starts at 12 percent and quickly increases to 18 percent, with five torturous switchback turns. Thick, abrasive dust adds still further to the grueling test.

Under these conditions the Allis-Chalmers engines have averaged over 5,000 hours of operation before their first overhaul. Many of them have given more than 20,000 hours of service since 1949, and are still "going strong."

Other Allis-Chalmers engines also take a hand in production even before the hauling stage. A large shovel powered by a Model 6DCS-1879 engine has loaded out more than seven million tons of ore since June, 1949. There are Allis-Chalmers engines on the drills, compressors and dozers.

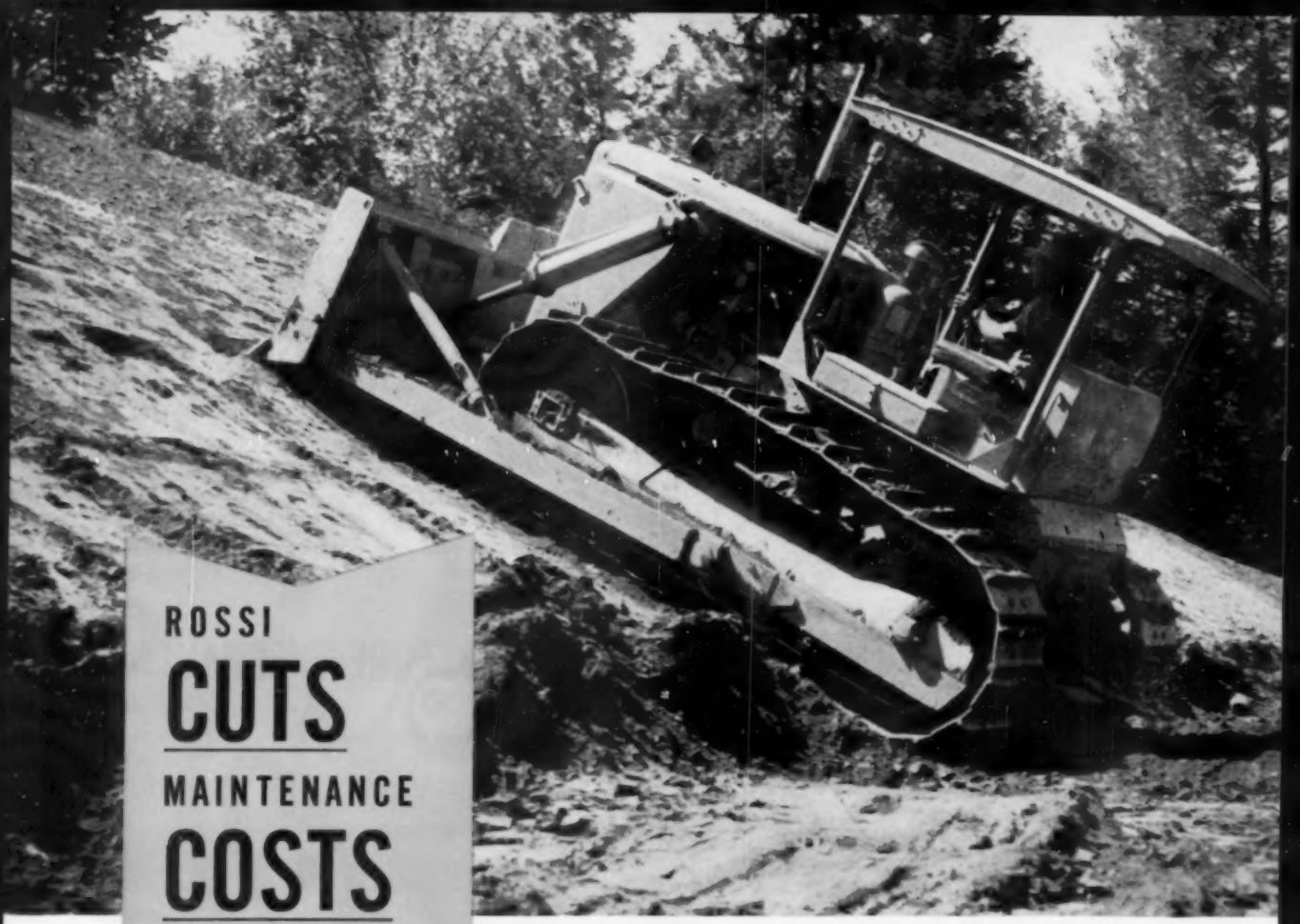
Altogether, the performance of these big, tough engines has helped hold the over-all cost of moving ore and overburden to less than ten cents a ton. It will pay you to put productive performance like this under the hood of your trucks and other units. Write for complete details and the name of your nearest Buda Division dealer.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

BC-1

Trucks at the Bagdad Copper Corp. mine, Bagdad, Arizona, haul overburden and ore up grades as steep as 18 percent and around five torturous switchbacks — a real test for any hauling unit and its engine.



ROSSI CUTS MAINTENANCE COSTS WITH CAT-BUILT EQUIPMENT

S. V. Rossi Construction Co., of Torrington, Conn., has found it pays to keep accurate records of machine costs. Here's a report by Mr. Adolph Rossi:

"When we buy a machine we figure the maintenance cost over a season. We've found there's no comparison—Caterpillar-built equipment has it over all other makes. We started in 1930 with machines built by two other manufacturers. Later we started trading them for Cat-built equipment because we had seen the light. Now we have all Caterpillar Diesel Tractors."

One of the machines in the Rossi fleet is the CAT* D7 Tractor with No. 7S Bulldozer, shown here grading a slope on a road construction job between Bethel and Woodstock, Vermont.

The D7 is a long-time favorite with contractors—a rugged, dependable producer. Today the *new* D7 (Series C) gives you the added advantage of a 128 HP engine and 28,700 pounds maximum drawbar pull. It has the long-wearing Caterpillar oil clutch; a gear driven balancer that gives smoother performance; a new starting engine with more power, and simple, single-lever control for easier operation. Track shoes are hardened by the "water-quench" process for longer life than ever.

Get the full facts about the new line of big yellow tractors from your Caterpillar Dealer. He'll give you a demonstration right on your job, and prove the claim of lower maintenance cost with facts. He offers reliable 24-hour service as well as a full stock of Caterpillar parts—parts you can trust. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

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Excavating Engineer
founded 1905

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The most important date for the Construction Industry in 1957

A.R.B.A.
ROAD SHOW and CONVENTION
PLAN NOW!

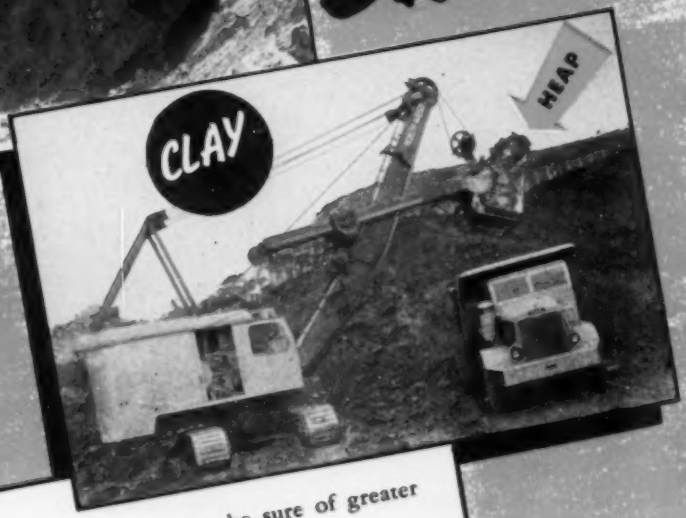
1957 will bring with it the first Road Show in almost 10 years! Tremendous advancements have been made in this last decade. New equipment has been developed. New methods have superseded old. New cost-cutting ideas have come forward. Here is the time and place to bring yourself up to date on all the new developments.

Nothing is being spared to make this 1957 Road Show the greatest indoor exhibit of machinery and materials ever gathered together. At the same time, the A.R.B.A. convention will give you an opportunity to learn about new methods and practices and hear outstanding authorities discuss the solution of problems that are bothering you.

Put it down as the most important date for the construction industry in 1957. Write for data on reservations. Ask to be put on the list to receive future information on the 1957 A.R.B.A. Road Show and Convention.

AMERICAN ROAD BUILDERS' ASSOCIATION
World Center Building
Washington 6, D.C.

IF IT'S A REAL ROCK Shovel-



Any digging is EASY!

● When you have the power for the tough digging you can be sure of greater output in the easy jobs. If it's a real Rock Shovel any digging is easy!

Maybe your immediate problem is loading sand. Maybe you think that's always going to be your problem—loading sand, and you think you can get by with a lighter, less rugged machine.

Remember this! Northwest utilizes force most other independent crowd shovels waste. Watch a Northwest at work. With the Northwest Dual Independent Crowd the Northwest cuts through the bank smoothly without stuttering, without the restarts that delay other rigs. Uniform Pressure Swing Clutches are smooth in action and eliminate the jerks and grabs of ordinary clutch designs, assuring accurate spotting without waste of time or excess spillage. The "Feather-Touch" Clutch Control gives the *feel of the load* and simple mechanical design eliminates the complications of pumps, compressors, valves and tubing. Simplicity of design results in ease of upkeep and reduced down time and combines with other Northwest advantages to give high output that pays out profitably whether your digging is tough or easy.

NORTHWEST ENGINEERING COMPANY
1506 Field Building • 135 South La Salle Street • Chicago 3, Illinois

SHOVELS
CRANES
DRAGLINES
PULLSHOVELS

YOU CAN'T HAVE
NORTHWEST ADVANTAGES
UNLESS YOU OWN A NORTHWEST

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

S & M Construction Company, Providence, R. I., uses 12 of these Mack LJSWX diesel dumpers under 2-yard Lorain shovel in excavating peat bog near Atholl, Mass., on a by-pass for U. S. Route 20.

ONLY A SPECIALIST NEED APPLY...

. . . For only Macks can get in and out of mud like this under their own power!

Axle deep in soft, soupy mire and hauling a full load of heavy peat bog, 80% water, this Mack dumper will pull out of the muck and be on its way . . . and back again on schedule.

It's Mack's famous Balanced Bogie, along with Mack's exclusive Power Divider, that makes seemingly impossible tasks like this everyday assignments for Macks. This wonder-working team delivers torque to each wheel in proportion to its traction. In addition, it assures uniform tire loading and braking on all four rear wheels, and maximum stability under any terrain or road conditions.

When you add the Balanced Bogie and Power Divider to Mack's rugged construction, ease of maintenance, and economy of operation, you'll see why Macks are the most versatile trucks, the biggest money makers in the construction industries today. See your Mack Branch or Distributor for complete details. Mack Trucks, Empire State Building, New York 1, N. Y.

MACK . . . *first name for trucks*

3569

Bucyrus-Erie 38-B shovel excavated one-third of total yardage on this job with rock and conglomerate predominant material.

CALIFORNIA CONTRACTOR PASSES TOUGH TEST ON FIRST BIG JOB

When this Southern California contracting firm was awarded the contract for rebuilding 8.16 miles of secondary highway in east-central California, work plans had to be made carefully. A few of the reasons: the job was in a remote location between Bridgeport and the Nevada line, 8000 feet up in the Sierras, and through plenty of tough granite rock.

Breakdowns were the principal worry, for this was the biggest job the firm had ever tackled. Two major decisions were made: (1) to use equipment known for dependability, and (2) to service each piece up to factory-approved standards.

A new 1½-yd. Bucyrus-Erie 38-B shovel took over the toughest excavating. Pre-bid estimates were based on 1,000 cubic yards of excavation per 8-hour shift for this machine. Weeks went by and the 38-B worked a full shift daily with no lost time, handled boulders up to 72 inches in diameter, and dug rock so well that blasting was negligible. Final yardage figures for the long-haul phase of the job showed the 38-B averaged up to 1,200 cubic yards per shift — 20% better than the pre-bid estimate.

This same 38-B, equipped with dragshovel front end, just completed another difficult job for its owner, I. L. Croft & Son, Inc. of Saugus, California. This one was the construction of an aqueduct for the City of San Diego and, once again, Bucyrus-Erie dependability and big-output performance helped the owner finish the job on time, and at a profit.

That same kind of performance is ready to go to work for you — in excavators from ⅜ to 4-yd. sizes. See your Bucyrus-Erie distributor soon for complete information. 99E55C

Here the new highway hugs the bank of the East Walker River, 6,000 ft. up in the Sierras.

BUCYRUS ERIE

South Milwaukee
Wisconsin

JOBS on the move

New design, outstanding features of Allis-Chalmers HD-11 Tractor and HD-11G Tractor Shovel help step up output on all kinds of work

Dozing and excavating in Paradise Valley, Pa., this HD-11 dozer-tractor is working on the job of replacing and relocating parts of a township road washed out in floods. The unit, owned by S. R. Nauman and Sons, Cresco, Pa., is shown here dozing out part of the 2,000-yd excavation, preparing grade for placing 10,000 tons of crushed stone base.

Grading, stripping and stumping are some of the jobs handled by this HD-11 Tractor with hydraulic bull-dozer blade. The unit, shown here stripping a gravel borrow pit for fill on roads, is owned by Atlantic County in New Jersey. There's a full program of work for the tractor — snow removal in winter and general maintenance on 390 miles of road the rest of the year.

Clearing and skidding on a logging operation is the full-time job of this HD-11 Tractor. Equipped with a canopy and dozing blade, the unit is working in Deschutes National Forest for Lundgren Lumber Co., Bend, Ore.

Excavating and stockpiling topsoil for a new athletic field in Bel Air, Md., this HD-11 Tractor with bulldozer is on the job about 50 hours a week. The owners, T. & T., Inc., Whiteford, Md., use the tractor to strip topsoil, grade area, replace topsoil and landscape. About 28,000 yd of excavation will complete the job.

Excavating and dirt moving on a 12,000-yd job for a service station location is speeded by this HD-11G tractor shovel. The new unit is one of a fleet of five Allis-Chalmers tractors owned by Bass Construction Co., Seattle, Wash. A new Allis-Chalmers engine, 105 net engine hp, provides plenty of power and handles hydraulic requirements with ease.

Road building and maintenance in Franklin Parish, La., get an assist from a new HD-11 tractor-bulldozer. The unit is at work widening 40 miles of farm-to-market road near Wisner. Later, it will aid with regular maintenance on 1,750 miles of parish road.

Scraping and dirt moving for Don L. Builders, Inc., Kansas City, Mo., this HD-11 Tractor and 7½-yd Allis-Chalmers scraper combination moves 15 yd every sixteen minutes on a 300-yd haul. Operator Ralph Alewel states, "This tractor has plenty of power. I'm running in third gear most of the time. The unit is much more comfortable than any I've been on."

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Your Allis-Chalmers dealer can tell you where to see HD-11's in action in your neighborhood.

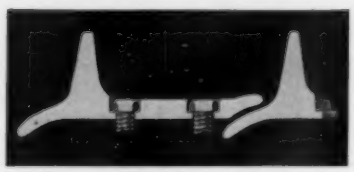
ALLIS-CHALMERS

Switch to extra-tough AMSCO® MANGANESE STEEL TRACTOR SHOES

When the going is extra tough, as in rocky areas or abrasive mineral soils . . . tractor shoe replacement can become a major cost item. Both repair time and down time eat up profits.

Switch to "the toughest steel known" . . . Amsco Manganese Steel . . . for tracks and grouser bars. Check their much longer service life against the moderate extra cost. Add to this the greater efficiency and pulling power of your tractor, over a longer period of time. The answer: *important operating economies.*

Amsco Manganese Steel gives excellent resistance to abrasion accompanied by impact . . . actually *work-hardens* in use. Write for full information on long-wearing Amsco Manganese Steel Tractor Shoes—the economical answer to high track-replacement costs.



COUNTER-SUNK BOLT HOLES

Amsco Track Shoes have holes countersunk for less wear on bolts. Saves cost of replacing bolts when changing shoes.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DELAWARE, OAKLAND, ST. LOUIS, JOLIETTE, QUEBEC

MONARCH WHYTE STRAND is available in the right size and type for today's faster, higher output construction equipment.

A thousand and one types and sizes of MONARCH WHYTE STRAND are designed and constructed to give you high quality Wire rope for all your needs.

When you work wire rope like this MONARCH WHYTE STRAND pays off in service!

PREformed MONARCH WHYTE STRAND meets the needs of your equipment—with flexibility, strength, and abrasion resistance!

There's no guesswork involved in getting the rope you need for scrapers, draglines, shovels or any other equipment. Any Macwhyte distributor can supply your needs from a thousand and one types and sizes of MONARCH WHYTE STRAND. These are supplied Internally Lubricated and PREformed, in Lang Lay or Regular Lay, with Independent Wire Rope Core or Fiber Core.

There are correct MONARCH WHYTE STRAND Wire Ropes for all equipment. Give this rope an opportunity to serve you—you will be more than pleased with its performance.

MACWHYTE WIRE ROPE

Macwhyte Company, 2903 Fourteenth Avenue, Kenosha, Wis.

Ask for Booklet 5325 "Wire Rope Recommendations for Contractors' Equipment"

Manufacturers of: Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies.

MILL DEPOTS:

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Portland 9, 1603 N. W. 14th Ave.
Seattle 4, 87 Holgate St.
San Francisco 7, 188 King St.
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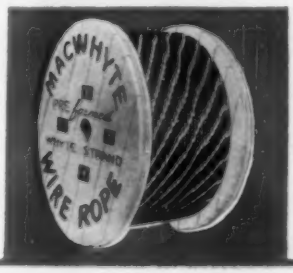
Distributors conveniently located throughout the United States.



Properly PREformed and Internally Lubricated MONARCH WHYTE STRAND has the strength, flexibility and resistance to abrasion that means maximum efficiency under toughest service conditions.

Whether you need rope for scrapers, draglines, shovels, dozers, etc.—you'll find the Rope you need recommended in Booklet 5325. Ask for your free copy from your Macwhyte distributor.

Picks up as much as 30 cubic yards at a bite

TIMKEN® bearings reduce cable wear

IMAGINE the strain on the cables as this big Bucyrus-Erie walking dragline picks up 30 cubic yards of dirt, then swings and dumps it! To prevent excessive cable wear and keep down-time to a minimum, the boom point sheaves are mounted on Timken® tapered roller bearings.

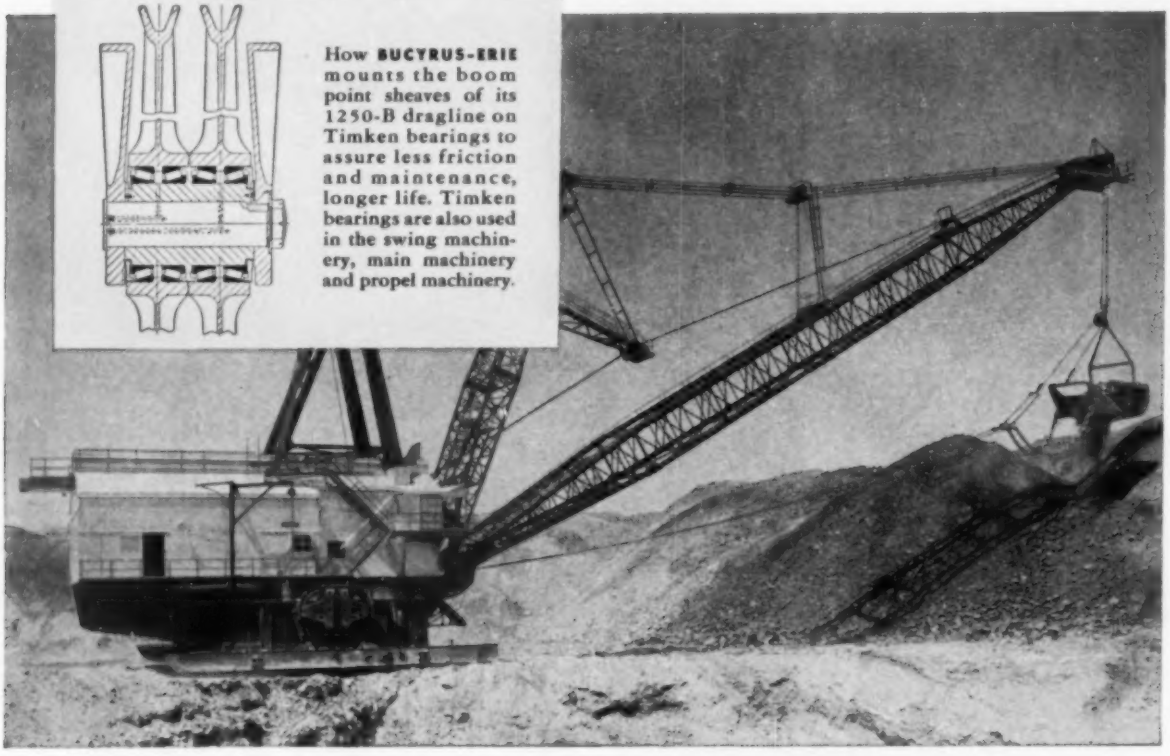
Timken bearings reduce cable wear because they practically eliminate friction and cable slippage. They can because they're designed to roll true; and because they're made with microscopic accuracy to conform to their design. And you're doubly assured of Timken bearings' quality because we make our own steel. No other U. S. bearing maker does.

Each of the two sheaves in the swivel yoke is mounted on a pair of Timken bearings. Because of their tapered construction, Timken bearings take radial and thrust loads or any combination. They take radial loads when the bucket is dragged in and hoisted; they take thrust loads when the heavy loaded bucket swings in mid-air. And they easily take the sudden jerks caused by cable slack and boulders during the drag operation—because rollers and races of Timken bearings are case-hardened to give them hard, wear-resistant surfaces over tough, shock-resistant cores.

Always specify Timken bearings in the equipment you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **BUCYRUS-ERIE** mounts the boom point sheaves of its 1250-B dragline on Timken bearings to assure less friction and maintenance, longer life. Timken bearings are also used in the swing machinery, main machinery and propel machinery.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

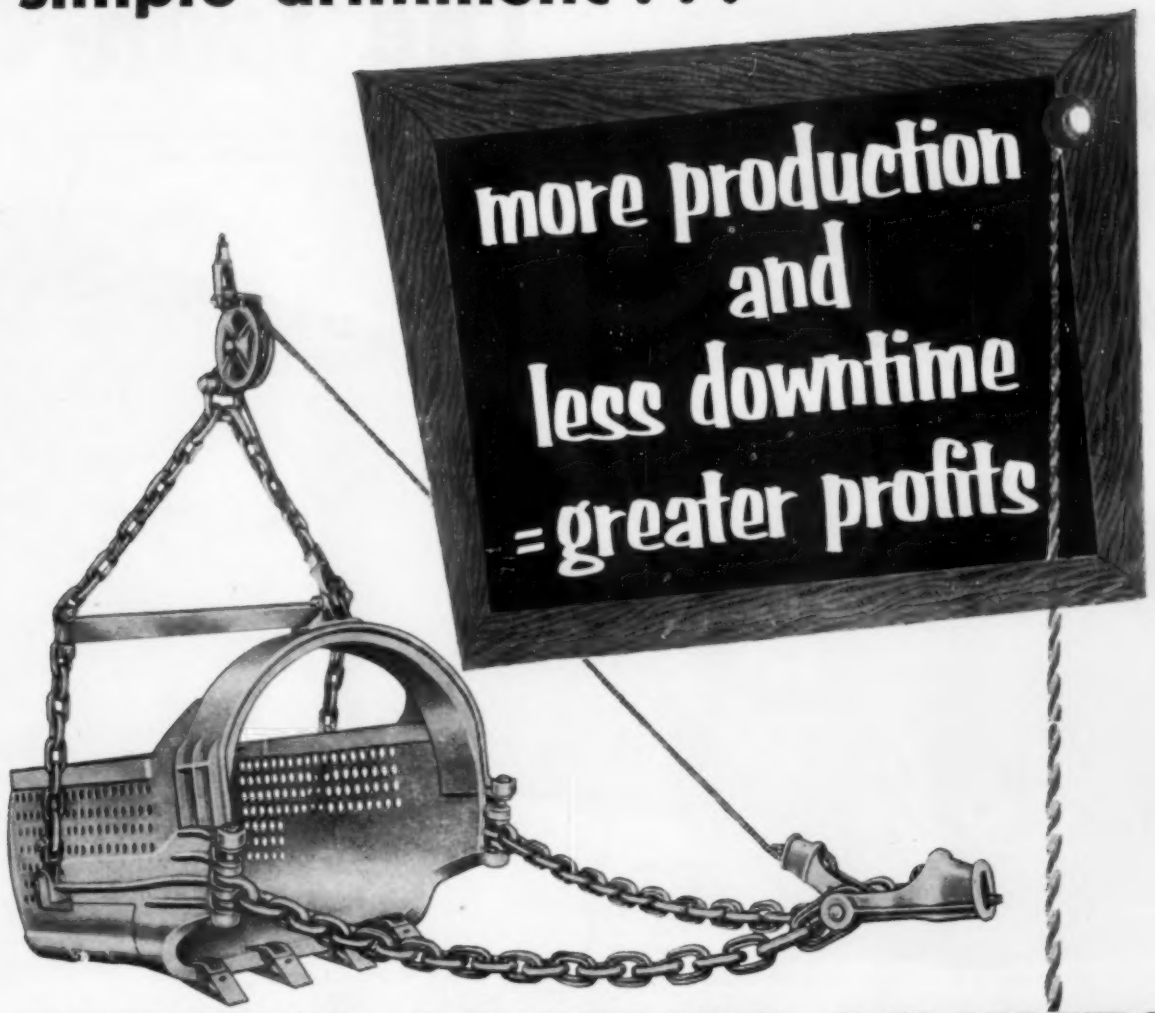
WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ▯ AND THRUST →▯← LOADS OR ANY COMBINATION →✳←

simple arithmetic . . .



HENDRIX DRAGLINE BUCKETS

assure greater output at lower cost

It's simple Arithmetic! Hendrix Buckets are built for trouble-free performance, day in and day out. This . . . plus a maximum load every trip . . . assures BIGGER PROFITS on every operation.

A TYPE FOR EVERY DIGGING PURPOSE
¼ to 40 Cubic Yards

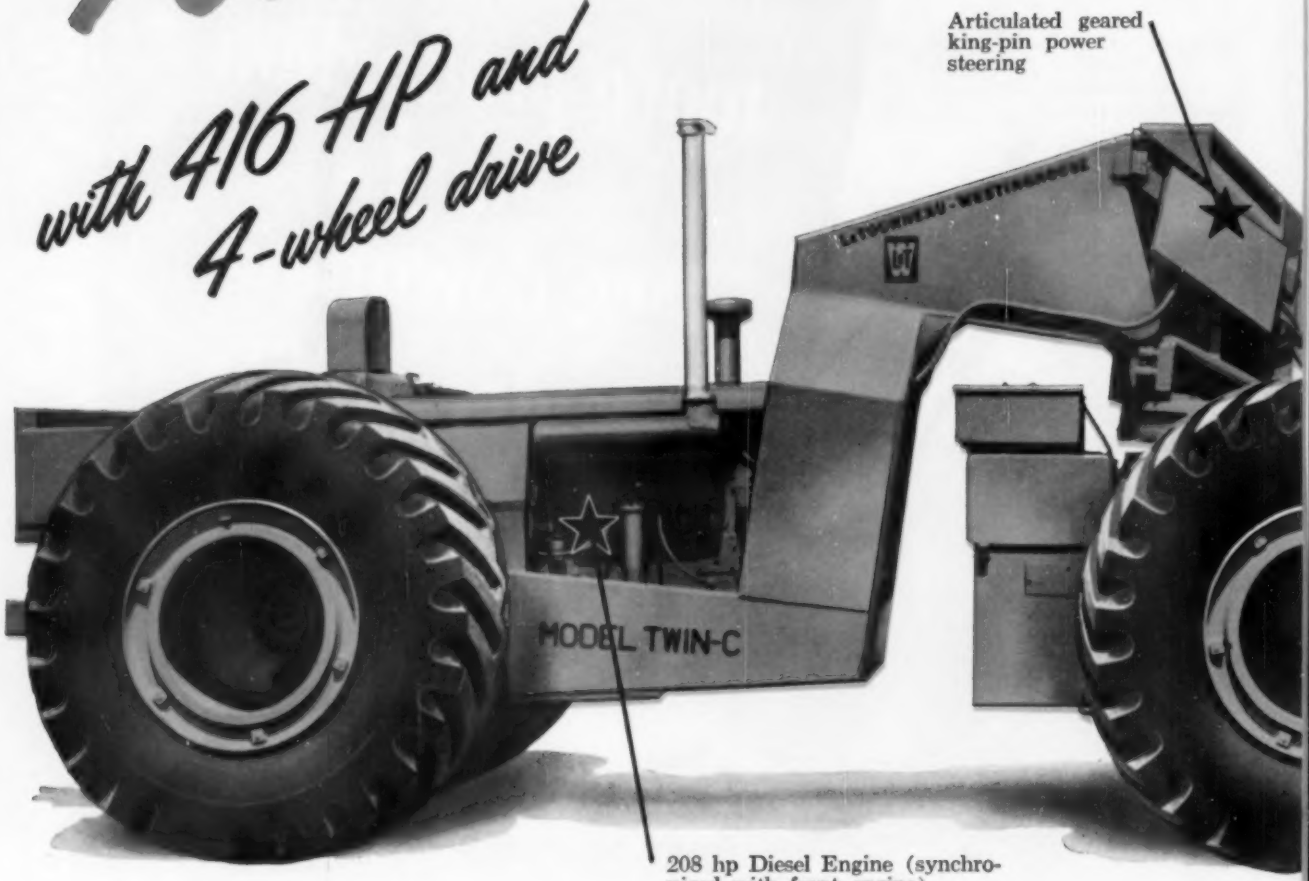
All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight Dragline Buckets

Now... world's MOST POWERFUL and The Twin-C

with 416 HP and 4-wheel drive



...to give you bigger loads in shorter loading time

One operator, and this powerful "Twin-C", pushes your biggest production scrapers for capacity yardage ... in less time than it takes 2 crawler-pushers with 2 operators. Rubber-tired speed, and articulated steer, give quick maneuverability for direct-line push... save seconds in picking up the next load. "Twin-C's" 416 hp push saves extra seconds in loading... piles a bigger heap on a better packed load.

Synchronized power matches speeds of earth-movers — Speeds of Twin-C Pusher are matched to loading speeds of today's rubber-tired earthmovers. You take maximum advantage of combined power of loader and pusher to get big pay loads *fast*. Low-pressure, trouble-free torque-converters teamed with constant-mesh transmission in both front and rear engines of the "Twin-C" reduce costly "lug downs" and gear changes necessary in many pushers.

More usable power with rubber pushing rubber — Big 29.5 x 29 tires with 22-ply rating give "Twin-C" 2'5" wide ground-gripping traction to take advantage of its 80,000 lbs. weight. Tires are hydro-flated and have wheel weights. With both pushing tractor and

LeTourneau-Westinghouse Tournapull Scraper Line...

B TOURNAPULL 25 cu. yds., heaped

C TOURNAPULL 18 cu. yds., heaped

D TOURNAPULL 7½ cu. yds., heaped

Optional LeTourneau-Westinghouse equipment for use with Tournapull Prime-Movers: Rear-Dumps, Bottom-Dumps, Flat-Beds, Logging Arches and Skidders, Lift-and-Carry Cranes, Snow Plows, Bulldozers.

FASTEST push tractor...

Pusher

One operator uses push-button control for perfectly matching direction, power, and speed of pusher and loader.

208 hp Diesel Engine (synchronized with rear engine)

Powerful 80,000 lb. Twin-C Pusher on big, wide-base tires push-loads scrapers faster in shorter distances...permits use of more scrapers in fleet...eliminates delays waiting-for-pusher.

Wet or dry...416 hp Twin-C Pusher has power and traction to lick any kind of scraper material. This Twin-C loaded 23-yd. scrapers fast in a wet fill to keep this job on schedule.

scraper unit on rubber, you have full floating traction ... tire treads follow tire treads ... no loss of power required to flatten out rounded tire-tracks into flat track-tracks. With speed and power characteristics better matched ... and matched rubber-tired traction ... you get greater usable horsepower and coordinated pushing force when you push rubber with rubber.

High-speed for fast-positioning — Rubber-tired speeds up to *20 mph forward and fast reverse*, plus "articulated" steer, allow Twin-C Tractor to back-up fast, turn faster, position faster behind scrapers.

Floating push-plate, electric-controlled — Big 49½" x 88" heavy, concave push-bowl is positioned by an electric motor to take full advantage of contact area provided by scraper push-block. Operator can "feel" the load to determine best position of push-bowl for direct-line push to pile dirt in scraper *fast*.

Push-button electric-controls — Famous "instant" response electric-controls give you positive power-steer of pusher and power-positioning of push-plate. Electrical system is safe, trouble-free, weather-proof ... same type controls used successfully on LeTourneau-Westinghouse scrapers for more than 8 years.

Power-transfer differentials — Exclusive power-transfer differential matches pull to traction, automatically applies power to wheels on firmest footing, keeps big pay-loads rolling out in sand, mud, and loose materials. "Twin-C" decreases time lost because of bad weather and soft going ... increases length of work season ... with greater profit possibilities.

If your fleet includes production scrapers of any kind, you will want full information on this Twin-C Pusher. Ask your LeTourneau-Westinghouse Distributor for complete details.

Tournapull—Trademark Reg. U.S. Pat. Off., Twin-C—Trademark TW-1025-G

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

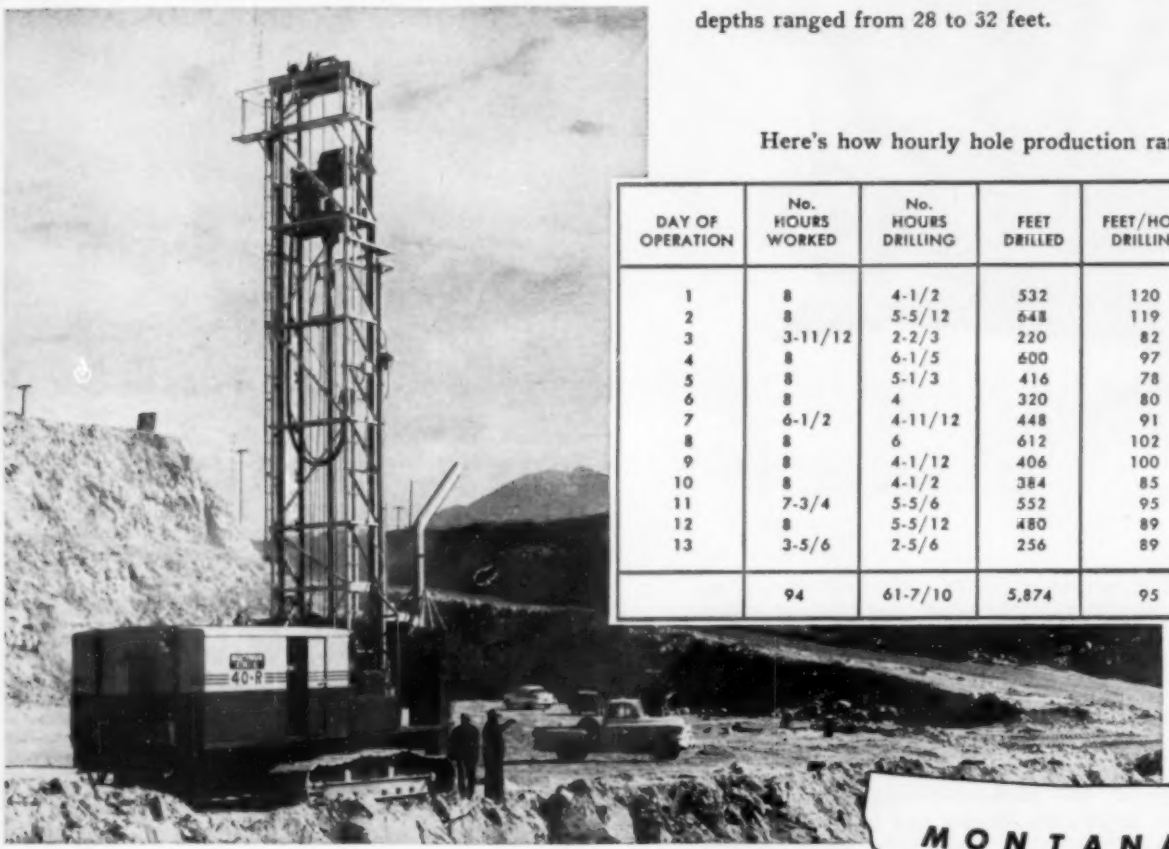
A Subsidiary of Westinghouse Air Brake Company

Butte, Montana . . .

another example of how Bucyrus-Erie rotaries cut costs on big-volume stripping jobs

F & S Contracting Company and Morrison-Knudsen Company, Inc., joint venture stripping contractors on a large Montana copper property, have adopted a modern high-speed drilling program which allows maximum economy in use of shovel loading and truck hauling units. The drill chosen to meet their needs was this electrically powered Bucyrus-Erie 40-R rotary.

According to F & S officials, the 40-R has worked so rapidly that it has stayed ahead of a 6-yd. shovel, even when operating less than a full shift each day. Drilling procedure consists of putting down 9-in. diameter holes spaced on 21-ft. centers. A daily log for the initial period of operation shows the 40-R drilled 5,874 feet of hole through decomposed granitic rock in 62 hours drilling time — a rate of 95 feet per hour. Hole depths ranged from 28 to 32 feet.



Here's how hourly hole production ran:

DAY OF OPERATION	No. HOURS WORKED	No. HOURS DRILLING	FEET DRILLED	FEET/HOUR DRILLING	FEET/SHIFT HOUR
1	8	4-1/2	532	120	67
2	8	5-5/12	648	119	81
3	3-11/12	2-2/3	220	82	56
4	8	6-1/5	600	97	75
5	8	5-1/3	416	78	52
6	8	4	320	80	40
7	6-1/2	4-11/12	448	91	69
8	8	6	612	102	77
9	8	4-1/12	406	100	51
10	8	4-1/2	384	85	48
11	7-3/4	5-5/6	552	95	71
12	8	5-5/12	480	89	60
13	3-5/6	2-5/6	256	89	66
	94	61-7/10	5,874	95	62-1/2

When excavation quantities run high, the fast, large-diameter hole making ability of Bucyrus-Erie rotaries really pays off. Let us tell you how they can cut preparation time and drilling costs in your operations. Write today for detailed, illustrated literature. Model 40-R drills 6-3/4 to 9-in. holes and is available with either diesel-electric or full electric power. Model 50-R drills 9-7/8 to 12-1/4-in. holes and is electrically powered.

BUCYRUS ERIE

33856C

76th Year of Service to Men Who Shape the Earth

South Milwaukee, Wisconsin

New "B" Rear-Dump offers you big capacity PLUS

High speed

B Tournapull Rear-Dump has forward speeds from 2 to 34 mph, plus two reverse speeds, 2 and 4 mph. Wide selection of speeds enable "B" to climb steep grades.

Easy loading

Loading of new "B" is made easier by large "target" area of bowl. Its 17′8″ length, 10′2″ width, and 7′6″ depth make it ideal for any size shovel. Rear of body provides wide, low entry for dipper to give extra speed advantage for the excavator. Big 35-ton capacity can make every load a profitable one.

Fast dumping

At the touch of a dashboard switch, body raises to vertical position. Edge of bowl swings behind and below rear wheels so rocks cannot roll forward to lodge against wheels nor can material pile under rear end.

180° turn in 35′ space

Two wheel prime-mover turns 90° right or left . . . machine in normal use makes non-stop 180° turn in space only 35′ wide. With body in dump position, machine can turn 180° in only 27′. This maneuverability of "B" allows you to work in tight quarters where smaller conventional haulers often cannot go. Jockeying back and forth to get into loading position is eliminated.

7536 square inches of braking surface

Heavy-duty air brakes with 7536 sq. in. of braking surface improve maneuverability . . . add to operator confidence for faster operation on steep grades and narrow winding haul roads.

New "B" also offers these additional features

- Big 7-ft. high 2-ft. wide low pressure tires for better flotation.
- Rugged body construction for longer equipment life.
- Simple, positive electric controls for fast, easy operating.
- Lower maintenance because there are no hydraulics, no long driveshafts, no springs or spring hangers.

For more information on this big new "B" Rear-Dump see your LeTourneau-Westinghouse Distributor.

Tournapull — Trademark Reg. U. S. Pat. Off. BR-888-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Excavating Engineer
founded 1905 APRIL, 1956

Fourteen interchanges, including this one under construction at Framingham, will provide access to the Massachusetts Turnpike.

Bay State Builds a Toll Road

Cranes pour concrete for construction of a box culvert in Grafton at Route 140. Target date for completion of the Turnpike is November 15. Work started in 1955.

MASSACHUSETTS' inviting countryside is yielding for almost its entire length these days to the demands of experienced construction men.

Before 1956 ends, these men hope to have added Massachusetts to the growing list of states with self-liquidating turnpikes.

The 123.3-mile Massachusetts Turnpike will extend from the New York state line to Weston, seven miles west of Boston. A study now being conducted will determine the feasibility of carrying the toll road into Boston.

At Weston, the Turnpike will connect with state Route 128, a modern circumferential highway of Metropoli-

123-mile Massachusetts Turnpike will start at New York line and run to near Boston.

(Above) A 4-yd. shovel loads fill to a truck. (Below) Hard rock on western portion of project keeps a drill and a shovel busy.

tan Boston which offers connection with the New Hampshire and Maine turnpikes.

The New York Thruway Authority is planning a branch that would connect the Thruway with the Massachusetts Turnpike.

Below Worcester, at Sturbridge, Mass., an interchange connection with the Connecticut Turnpike system (Wilbur Cross Parkway) is being constructed. The Wilbur Cross Parkway provides access to Metropolitan New York.

Except for 12½ miles of six-lane roadway from the Route 9 interchange at Framingham to the eastern terminus at Route 128, the Turnpike will be a four-lane divided highway. Elsewhere on the turnpike, provision has been made to enlarge to six lanes, if necessary. The 33½-mile section between the Route 15 interchange at Sturbridge and the Route 9 interchange at Framingham eventually may need extra lanes. Provision has been made to widen bridges to eight lanes between the routes 9 and 128 interchanges and to six lanes between the routes 15 and 9 interchanges.

The Turnpike will follow the old Bay Path Trail and will serve industry and agriculture alike in a beautiful New England state that is steeped in historical tradition.

The eastern part of the Turnpike will

serve the residential areas west of Boston and the industrial areas of Framingham and Needham. From there west to the Connecticut River near Springfield, the Turnpike is located in alternating areas of industry and agriculture.

West of the Connecticut River, and for the remaining 45 miles to the state line, the Turnpike will go through the beautiful Berkshire hills.

The Turnpike will have 12-ft. wide lanes, with shoulders on the inner and outer lanes of each of the two roadways. Both shoulders will be paved. A stabilized grassed shoulder will be located outside the paved shoulder.

Generally, a raised grassed median 18-ft. wide will be utilized between the roadways.

On the long bridges over the Westfield, Connecticut and Chicopee rivers, a 6-ft. wide raised median will be provided. A median of the same width, with the addition of 4-ft. wide inner shoulders, will be utilized in long, deep cuts and in some of the more densely developed residential areas on the eastern end.

A 70-mph Highway

Designed as a 70-mph highway, the Turnpike will utilize long, sweeping curves with a desired minimum radius of 5,000 feet. In highly developed areas and in mountainous regions, the minimum radius of curves will be 3,000 feet.

The maximum grade generally will be 3%. In the Berkshires, the maximum upgrade will be 3½%, and the maximum downgrade 4%. Some rural areas also will have 3½% grades.

The pavement will consist of an 8-in. thick macadam and asphaltic concrete surface constructed on top of a 14-in. base of frost-free and free-draining material.

Inlets along the median or, in deep cuts, along the outer shoulder will drain the roadway surface. Discharges from inlets and ditches will be at natural watercourses or into storm sewers. Culverts will be used to carry brooks and streams beneath the roadways.

Culverts generally will be of reinforced concrete pipe. Culverts subjected to the weight of high fills will be of arched construction. Reinforced concrete box culverts will be used for large watersheds.

The Turnpike will have 185 deck-type bridges of economical construction and simple design. Major bridges are being built across the Westfield, Connecticut, Chicopee and Quaboag rivers. The Westfield River bridge will take the westbound traveler into the Berkshires. The river lies in a gorge 200 feet below the bridge.

Legislation for the turnpike was approved in July, 1952. Feasibility studies were completed in March and April of 1954. Bonds totalling $239 million, due in 1994, were offered for sale on May 1, 1954.

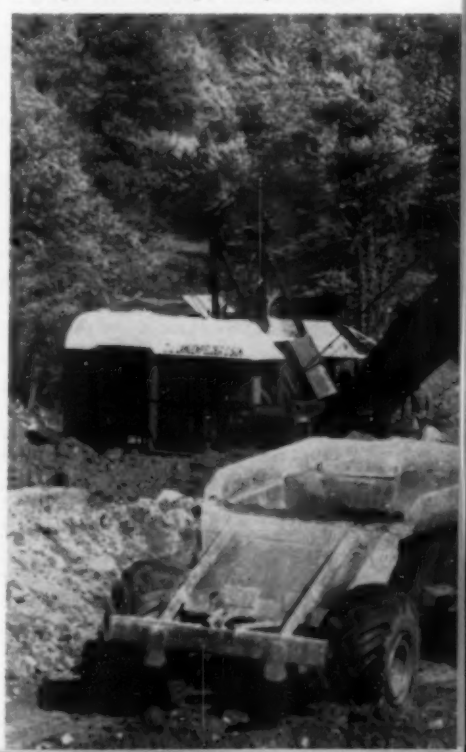
The first construction contract was awarded in November, 1954. Construction started in February, 1955. The target date for completing the Turnpike is

Turnpike Contractors

ALL major construction contracts for the Massachusetts Turnpike have been let. The prime contractors, with the mileage and value of the contracts and the location of the jobs, are:

Location	Miles	Contractor	Amount
Lee-Stockbridge, West Stockbridge	11.13	B. Perini & Sons, Inc.	$10,317,533
Lee-Becket	4.49	Lizza & Sons, Inc.	3,463,182
Becket-Otis	4.75	Elmhurst Const. Co.	2,571,415
Blandford-Otis	8.48	S. J. Groves & Sons, Inc.	4,513,884
Blandford-Russell	4.86	S. J. Groves & Sons, Inc.	4,809,532
Westfield River Bridge	.275	Daniel O'Connell's Sons	2,714,415
Montgomery, Westfield, West Springfield	8.93	Lane Construction Co.	6,209,290
West Springfield	.97	Henley-Lundgren Co.	1,990,658
Connecticut River Bridge Deck		Daniel O'Connell's Sons	376,076
Connecticut River Bridge Superstructure	.27	American Bridge Co.	1,707,657
Chicopee	1.76	Grandview Const. Corp.	2,389,905
Chicopee	2.35	L. G. Defelice & Son	3,322,181
Chicopee	1.08	L. G. Defelice & Son	1,830,940
Chicopee-Ludlow	5.8	Bayer & Mingolla Con. Co.	3,742,475
Ludlow-Palmer-Wilbraham	3.11	Grandview Const. Co. & Brunalli Const. Co.	3,370,275
Palmer	2.50	Berlanti Const. Co.	3,584,172
Palmer	3.65	Grandview Const. Corp.	3,764,692
Quaboag River Bridge	.16	Gilbane Bldg. Co.	1,263,085
Brimfield-Warren	4.89	A. J. Orlando Const. Co.	3,340,375
Brimfield-Sturbridge-Warren	3.80	L. G. Defelice & Son	3,487,230
Sturbridge	3.23	Henley-Lundgren	1,500,182
Sturbridge	3.54	Clark-Farrell & Rodgers	4,462,561
Charlton-Sturbridge	5.02	Clark-Farrell & Rodgers	3,462,561
Auburn-Charlton-Oxford	5.06	Nello L. Teer Co.	4,306,727
Auburn, Millbury	5.37	C. J. Langenfelder & Son	8,746,884
Grafton-Millbury	3.64	Gilbane Bldg. Co.	3,758,003
Grafton-Hopkinton-Upton-Westboro	6.63	Gilbane Bldg. Co.	6,294,657
Hopkinton-Westboro, Southboro-Ashland	6.63	M. DeMatteo Const. Co.	7,206,510
Framingham	3.47	M. DeMatteo Const. Co.	4,789,168
Framingham-Natick-Wayland	3.893	J. F. White Contracting & Consolidated Const.	4,719,719
Natick-Wayland-Weston	3.90	B. Perini & Sons, Inc.	3,753,194

A shovel loads fill to a dump unit. Maximum grade of road generally will be 3%.



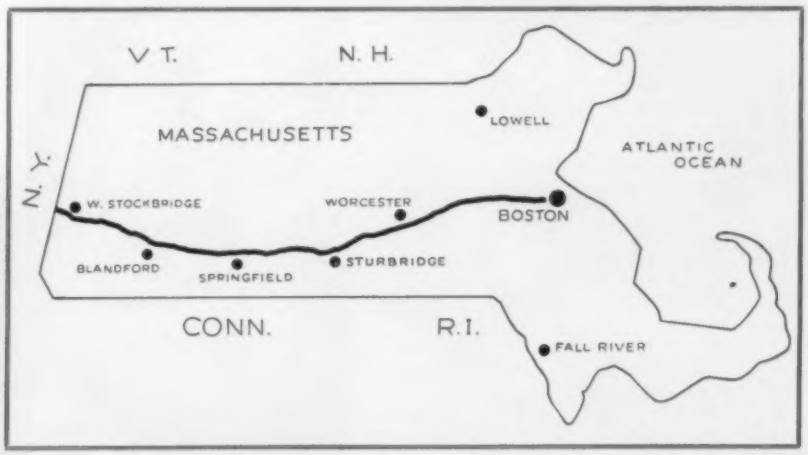
A 4½-yd. shovel loads rock to one dump, while another dump waits its turn. The Turnpike will serve industry and agriculture alike.

Nov. 15, 1956. Whether it will be met is uncertain.

The weather, in the form of August and October storms during which 55 inches of rain fell, delayed construction by washing out supply roads. Concrete and steel deliveries also have been behind schedule.

An east-west turnpike route was selected after a proposed diagonal turnpike across Massachusetts connecting with the Wilbur Cross and New Hampshire-Maine turnpikes was rejected in 1950. Traffic did not warrant such an undertaking, a study revealed.

Traffic conditions along current east-west highways in Massachusetts were termed "deplorable" in the engineering report presented to the Massachusetts Turnpike Authority in 1954 by Howard, Needles, Tammen & Bergendoff, general consultants to the Authority. "The need for the Massachusetts Turnpike is very great," the engineers told the Authority.



The principal east-west highway in the state, Route 9 between Worcester and Boston, though four lanes and divided, had become a residential and local business street in many heavily-settled areas, the report said.

Route 20 is the principal highway in the central and western parts of the state. Between Worcester and Springfield, Route 20 was termed a "death trap!" West of Springfield, through the Berkshires and into New York, Route 20 has only two lanes. Some of the grades are 7%.

The turnpike will have 14 interchanges of the single or double trumpet types. They will be located at West Sturbridge, East Lee, two miles north of Westfield, five miles north of Springfield, Chicopee (2), Ludlow, Palmer, Sturbridge, Auburn, Milbury, two miles west of Framingham Center, Framingham-Natick and Weston. Only Weston and West Stockbridge will have barrier-type toll booths; the others will be located on ramps.

Five service areas will be located on

Continued on page 79

Groves Meets Rock Challenge

Minneapolis firm is handling the biggest rock job on the Massachusetts Turnpike. It is using an impressive array of equipment to excavate 2 million yards of it in rugged section of Berkshires.

S. J. GROVES & Sons Co., Minneapolis, Minn., is handling the biggest rock job on the Massachusetts Turnpike project with an impressive array of equipment.

Sam Day, a veteran of 12 years with Groves, is the project manager directing the execution of two successive Groves' Turnpike contracts from an abandoned schoolhouse in the village of Blandford.

Blandford, which sits at about elevation 1,600 in the Berkshire hills in the western half of the state, is the dividing point between the two contracts which total 13.34 miles.

East of Blandford lies the toughest phase of the job. Contract No. 51-030 covers 4.86 miles of the Turnpike in which the elevation drops from about 1,600 feet at Blandford to 300 feet at the Westfield River. Excavation from this section will total about 1,800,000 cubic yards of rock and 800,000 yards of earth.

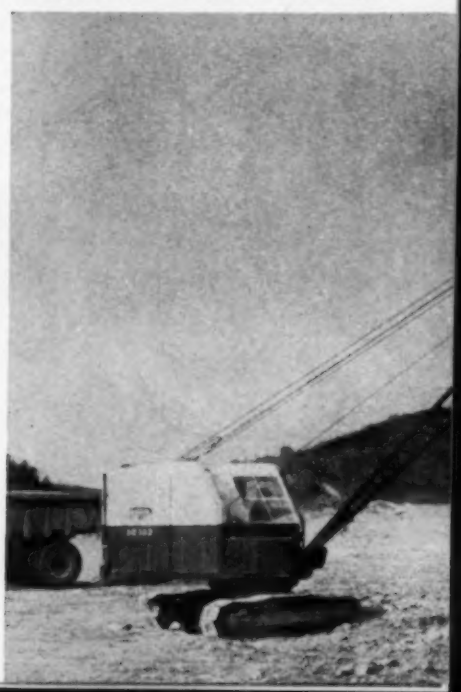
Working in a 100-ft. cut in the rugged eastern portion of the Groves job on the Massachusetts Turnpike, one of the firm's two 88-B's loads Euclid with blasted rock.

Other Section Is Longer

Groves' other Turnpike section is considerably longer, extending 8.48 miles west from Blandford, but the excavation job is easier. Excavation in this section (Contract 51-031) will total about 2 million yards, only about 200,000 yards of it rock.

Total value of the contracts exceeds $9.3 million dollars—$4,809,532.25 for the rock-bound section 030 and $4,513,884.25 for section 031. Groves moved in on section 030 last April. The

Look out below! A Paymaster uses a "headache ball" to further break rock.



Minnesota firm won the contract for section 031 in June and began to work it in July.

One Groves official estimated that his firm had from a third to a half of the rock excavation on the entire 123-mile length of the Turnpike. Whatever the actual percentage, there has been plenty of rock to keep Groves' drills, shovels and hauling units humming through a hot, sticky summer and a winter that didn't bring too much snow in its early stages.

Equipment didn't hum during two periods last summer and early fall. Production was reduced because of rain—and lots of it. More than 50 inches fell on the project between Aug. 1 and Oct. 20. Nearly 30 inches came down in a four-day period in August. About 15 inches came down in an October storm.

The rains and floods washed out the main access highway, state route 23, which runs parallel with the Turnpike for a distance, and dug up haul roads. The storms twice washed out an incompleted 126-in. twin-pipe culvert in section 030. S. J. Groves later was awarded a contract to rebuild Route 23.

A 2½-yd. shovel comes up with a load of rock and earth from the far eastern section of the job. S. J. Groves has two Turnpike contracts with a total length of 13.34 miles.

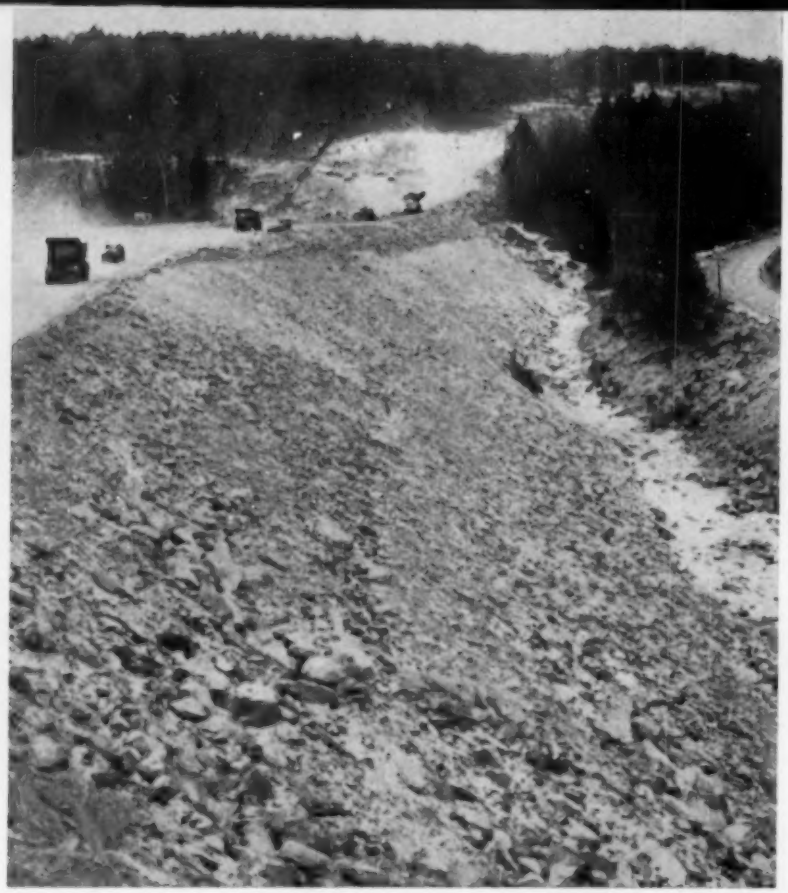
Assault Continues

Despite nature's delays, Groves was relentlessly continuing the assault against the rock when *Excavating Engineer* visited the job in late January. Overall, both contracts were about 50% completed.

The majority of the work has been concentrated in the eastern section, where four rock cuts in excess of 90 feet and up to 125 feet, were the principal objects of the insistent attackers. Some of the rock cuts were almost down to grade.

Some clearing remained to be done

A battery of Gardner-Denver Air-Tracs drills blast holes near one of the 88-B's.



in the western section, which will be the focal point of excavating activities this spring and summer.

Day, who was project manager for Groves on a six-mile section of the West Virginia Turnpike that demanded the removal of 3,200,000 yards of rock, has assembled a sizeable spread of equipment for the Massachusetts job.

Groves' shovel equipment includes six Bucyrus-Erie machines: two 4½-yd. 88-B's, two 2½-yd. 54-B's, one 1½-yd. 38-B and one ¾-yd. 22-B; three 2½-yd. Northwest 80-D's; and one Lima ¾-yd. Paymaster. He also has a Lima truck-crane.

Some of the excavation last summer was taken with 11 scrapers, six of them tractor-drawn LeTourneau-Westinghouses and five of them Caterpillar DW21 units. About 40 Euclid end and bottom dumps comprise the hauling fleet.

Tractor equipment includes 19 Caterpillar D8's, two Cat D6's and two Allis-Chalmers HD-21's.

With about 2 million yards of rock to be blasted, drilling equipment necessarily is of vital importance. All day long, the heavy sound of pounding steel pushing through stubborn rock echoes

(Above) This 600,000-yd. fill is located between two large rock cuts. (Below) A 2½-yd. shovel drops load of rock into a truck.

through the project. The sound comes from batteries that include 12 Gardner-Denver Air-Tracs and 19 Gardner-Denver wagon drills. Some 15 Ingersoll-Rand Gyro-Flo 600 compressors supply the air.

Timken tungsten carbide bits are being used for the 3-in. Air Tracs. The wagon drills are using 2¾-in. plain steel bits. The carbide bits are resharpened in the field after about 200 hours of use.

The Air Tracs generally are drilling on an 8 x 8 pattern. Most of the wagon drill work is done on 5 x 5 and 5 x 6 patterns. The Air Tracs are drilling to a depth of 24 feet or more; the wagon drills, 16 feet.

Three to Five Shots

Shooting is done three to five times a day. Various makes of explosives are being used. With roughly about a pound of explosives being used for a yard of excavation, approximately 2 million pounds will be required.

Much of the rugged rock excavation has been handled by the two 88-B's, both of them equipped with Buda diesel engines and torque converters and both employing 4½-yd. Esco dippers.

The first 88-B was at the 70-ft. level on a cut that would go up about 120 feet. About a half mile to the east was the other 88-B, digging and loading out mica schist in a 100-ft. cut that provided a chilling, but spectacular background of ice-covered rock. This cut was nearing grade.

Equipped with a Buda engine and a torque converter and carrying a 4½-yd. dipper, Groves' other 88-B is shown working in a cut that eventually will go up to 120 feet.

Two batteries of drilling equipment, both containing six Gardner-Denver Air Tracs, were working near the 88-B's. The operators of the drills were warmly clothed against the chill January air of the Berkshires. Surprisingly, the snow-cover was almost negligible, a warming note for production-anxious contractors on the Turnpike.

One of the Northwest 80-D's was digging and loading rock at the eastern end of the project.

Euclid end dumps worked under both the 88-B's and the 80-D. They hauled the rock to an impressive 125-ft. high fill located between the two 88-B's, where secondary crushing was administered by the 38-B equipped with a "headache ball." A Cat dozer spread the fill.

This fill, which is 800 ft. long, will require about 600,000 cubic yards of rock. At the end of January, all but the top 17 feet of the fill had been placed.

In all, about 4 million yards of material will be placed in numerous fills on the Groves job. Not all the excavated rock is necessary for fill. About 700,000 yards of waste rock are being dumped in waste areas acquired by Groves. The job also has another 120,000 yards of unsuitable material.

Air tools on the job are powered by batteries of compressors such as this one of four Ingersoll-Rand Gyro-Flo 600's. Groves has an impressive array of drilling equipment.

54-B Digs Rock

One of the 54-B's was positioned in a rock cut a few hundred feet west of Route 23. The machine was loading Euclids, which hauled the rock about a mile to a fill. A Lima crane equipped with a "headache ball" did secondary crushing.

The next scene of activity was about

Three Gyro-Flo 600's power these seven Gardner-Denver wagon drills. Groves' job has total of 2 million yards of rock excavation.

two miles to the west, where another 54-B was digging and loading rock. Euclids made a brief haul to a fill area.

Seven wagon drills, powered by three Gyro-Flo 600's, punctured the terrain nearby.

Groves has subbed a half-million yards of excavation in the extreme western end of section 031 to Green & Meadows Construction Co., Charleston, W. Va. The firm is using two 80-D's and from six to eight Euclid dumpers on the project.

Groves machines working in the western section during our visit were two 80-D's, the 22-B and the Lima truck crane. Equipped with a 3-yd. dragline bucket, the 80-D was taking out a stubborn deposit of sticky gray moraine clay. It loaded to Euclids for hauling to a disposal area.

The 22-B was placing drainage pipe; the Lima and the other 80-D were moving up to new locations.

Rock fill was being used on haul roads during the winter to insure their staying open. Cat No. 12 graders keep the roads in shape.

Day considered his wintertime production good. "We move an average of from 10 to 15 thousand yards a day," he said. Through the winter months, one 10-hour working shift was maintained, with Day planning to go back to two 10-hour shifts after the spring breakup.

Groves subbed the building of five structures in its sections to W. W. Wyman, Greenfield, Mass. Base course and paving work was subcontracted to the Alexander Construction Co., Minneapolis, Minn. Select material will be used

A load of material drops from the dipper of a 2½-yd. shovel to an end dump. Groves has concentrated much of its equipment to date in the rock-bound eastern section.

Equipped with a 3-yd. dragline bucket, a Northwest 80-D excavates a deposit of gray moraine clay in the western section.

for the 18-in. thick base course. Atop this, in two 6-in. lifts, will go 12 inches of 4-in. minus gravel. This will be compacted to a density of 95%.

Two 2½-in. lifts will be used in placing the 5-in. penetration macadam base. The 3-in. asphaltic-concrete surface layer will be put down in two 1½-in. lifts.

Provide Creeper Lane

Almost seven miles of the eastbound roadway will consist of two 12-ft. lanes and a 10-ft. paved shoulder. An equal length of the westbound roadway through the rugged cut and fill sections will have three 12-ft. lanes and no shoulders to provide a creeper lane for trucks.

Median widths will vary from a 4-ft. grassed section in cut areas to as much as 100 feet in some other sections.

Installation of the weather-raked 126-in. twin pipe culvert carrying a stream under the 125-ft. fill was completed by Groves during the winter.

The culvert is of two 550-ft. long corrugated multi-plate pipe lines. The August deluge came with about half of each line assembled and placed. One of the lines was washed about .3 mile away.

All but about 75 feet of each line had been assembled and much of it was placed when the October rains washed them out and necessitated another time-consuming rebuilding job.

Maintenance Facility

A completely-equipped central maintenance facility is located off the eastern section roadway, about three miles east of Blandford. Maintenance is ac-

Continued on page 80

A Caterpillar D8 dozer, one of more than 20 tractors on job, works in fill area.

Smiles are exchanged by Sam Day (left), Groves' project manager on the Turnpike, and Pete Sprenger, engineer. Day is a veteran of big rock job on West Virginia 'Pike.

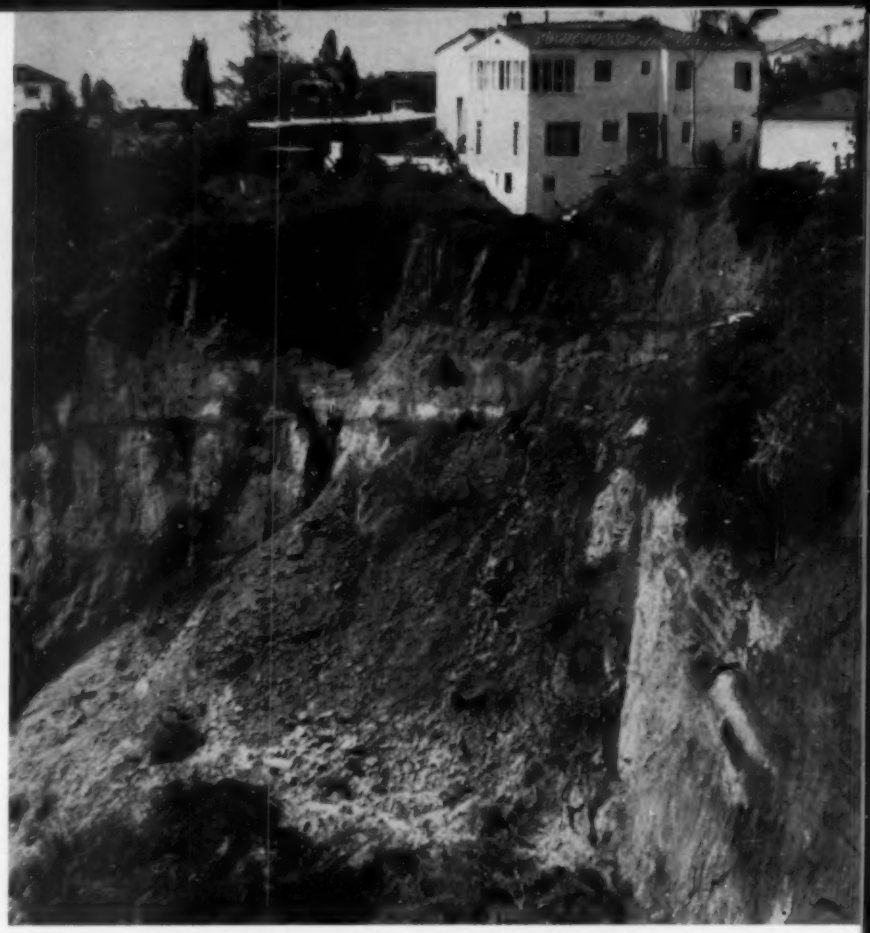
Los Angeles Adopts New Grading Law

by Floyd Suter Bixby

THE city of Los Angeles, long-time civic leader in the regulation of earthmoving for the public good, has cracked down even more with new rules pertaining especially to grading in hillside areas during the rainy season.

Adopted November 14, 1955 by the Los Angeles Board of Building and Safety Commissioners, the new rules are designed primarily to safeguard unstable areas from dangerous erosion. Other objectives were the prevention of surcharge overloading on saturated ground, the prevention of damage to property adjacent to graded areas, the conservation of soil and the protection of watersheds.

The new regulations enlarge upon rules first perfected by the Commission several years ago following the disastrous winter rains of 1952.



Torrential winter rains caused a cave-in here. Severe property damage has demonstrated to Los Angeles residents the need for comprehensive grading regulations.

A TD-24 dozer clears brush and trees from a hilltop. The city of Los Angeles carefully considers the possibility of soil erosion before issuing grading permits to builders.

Two years of study and investigation by the commissioners preceded adoption of the regulations. Field visits were made to numerous active grading jobs. Grading ordinances in the Los Angeles Municipal Code lawbooks were given a fine-tooth-comb reviewing. Private citizens and contractors were consulted. So was the United States Weather Bureau because accurate determination of the extent of danger during the rainy season was essential.

Underlying the necessity for the new excavation regulations is southern California's huge expansion, combined with topography which is nothing short of treacherous. The southern California coastal plain in the Los Angeles area is ringed on three sides by mountain ranges, rising sharply from near-sea-level flatlands. For the most part the plains area, formerly a land of orange

City of Angels is a leader in regulation of excavation practices in hillside areas.

Here's how subdividers are going to the hills for homesites. Drainage has been well planned in this terraced development.

groves and bean fields, has been built up, either residentially or industrially. Even the low-lands near river bottoms have been settled upon. That factor is the root of the area's flood control problem when the rains come between December 1 and April 1. And in recent years, more and more residential areas have expanded into the hills as people searched for new places to live. Powerful new ripping and bulldozer equipment, power shovels, dragshovels and draglines made the necessary grading both feasible and economical.

Semi-Tropical Rains Occur

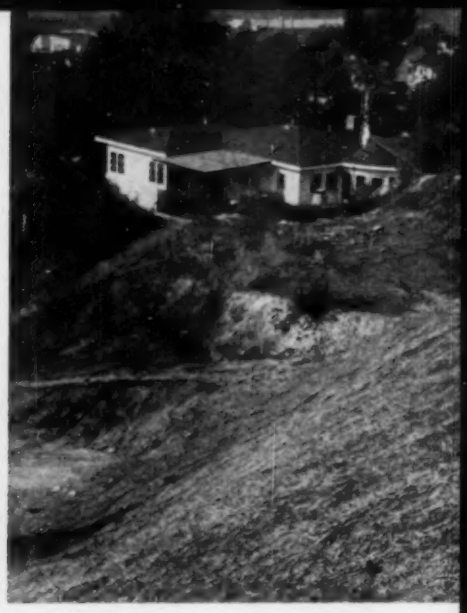
If the expansion of grading had been permitted to go on unchecked without adequate regulation, Los Angeles would have faced a disaster of major proportions. Semi-tropical rains occur in Los Angeles; in fact, the world's rainfall intensity record was established at Mount Wilson, only 23 airline miles from the Los Angeles Civic Center. Rains like that can literally wash away a home built on improperly graded and compacted ground.

Another phenomenon somewhat peculiar to the Los Angeles area are "mud waves"—the mass movement of saturated soil overburden, displaced and softened by rains, down hillsides and canyons.

The soggy slippage of Elysian Park several years ago was an example. During the 1934 flood at La Crescenta and Montrose, farther out in Los Angeles county at the base of foothills, a heavy downpour fell on an area whose ground cover had just been denuded by forest fire. The entire sheet of topsoil on a hill softened and slipped. Fifty-ton boulders were carried along as trees were uprooted and homes crushed. Trees, mangled and uprooted, jammed debris basins.

Because of this combination of many soil types, tricky hillside terrain, earth-

Grading equipment like this International TD-24 tractor and B-250 scraper combination makes large-scale earthmoving in hillside areas both feasible and economical.



New storm sewers are one answer to the problem of handling runoff water. A clamshell excavates the trench for a sewer line which will serve a mountainous area.

quakes and semi-tropical rain, Los Angeles had always been aware of the need for building regulations. As early as 1883 a comprehensive building ordinance was adopted by the city council, which included specifications for concrete foundations. By 1900, bearing values had been established for soil types common to the area. When the first 13-story building went up in Los Angeles in 1903, its foundation was designed according to the conservative ground pressures of the building code.

But grading went on through the years largely unchecked. Even the floods of 1934 and 1938 failed to arouse the people. It remained for a typical rainstorm in January 1952, when the hillside areas were becoming heavily settled, to demonstrate the need for comprehensive grading regulations.

On that January night, Los Angeles had an $8 million lesson in what disastrous damage a rainstorm can cause to improperly excavated hillsides. The fortunate people who were safe sat watching their television screens to see a drama of distress unfold. Hundreds of less fortunate families were literally pushed out of their homes by walls of

Hillside streets are planned for emergency use as drainage channels. This road is getting a good grade of plant mix.

This high, steep fill was ordered protected by wire mesh, straw and a seed cover.

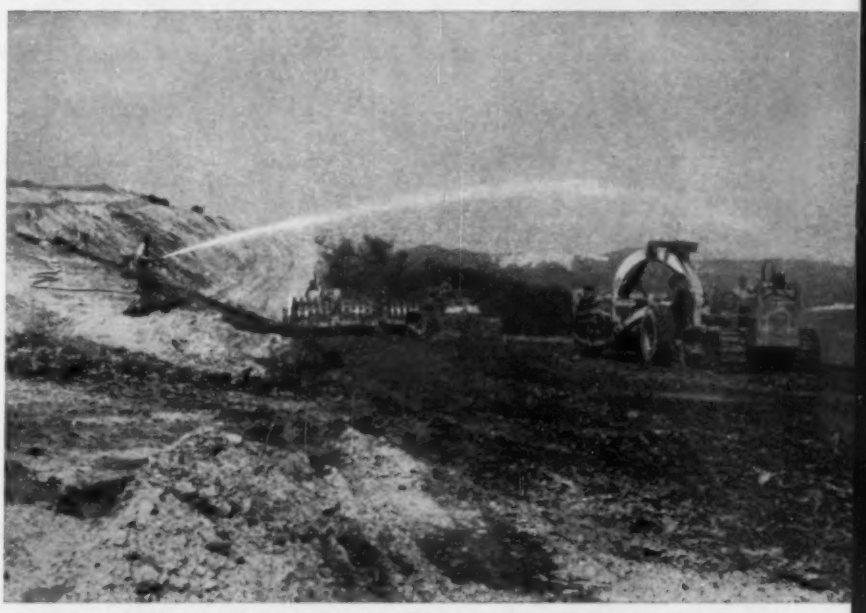
Excellent earthmoving practices are demonstrated on this Sepulveda Valley project. Developers must submit final contours for approval to the Building Division.

mud and water. Dormant watercourses sprang into life and became the vehicle for acres of soft earth that had so recently been leveled into lawns and garden plots.

Complaints Pour In

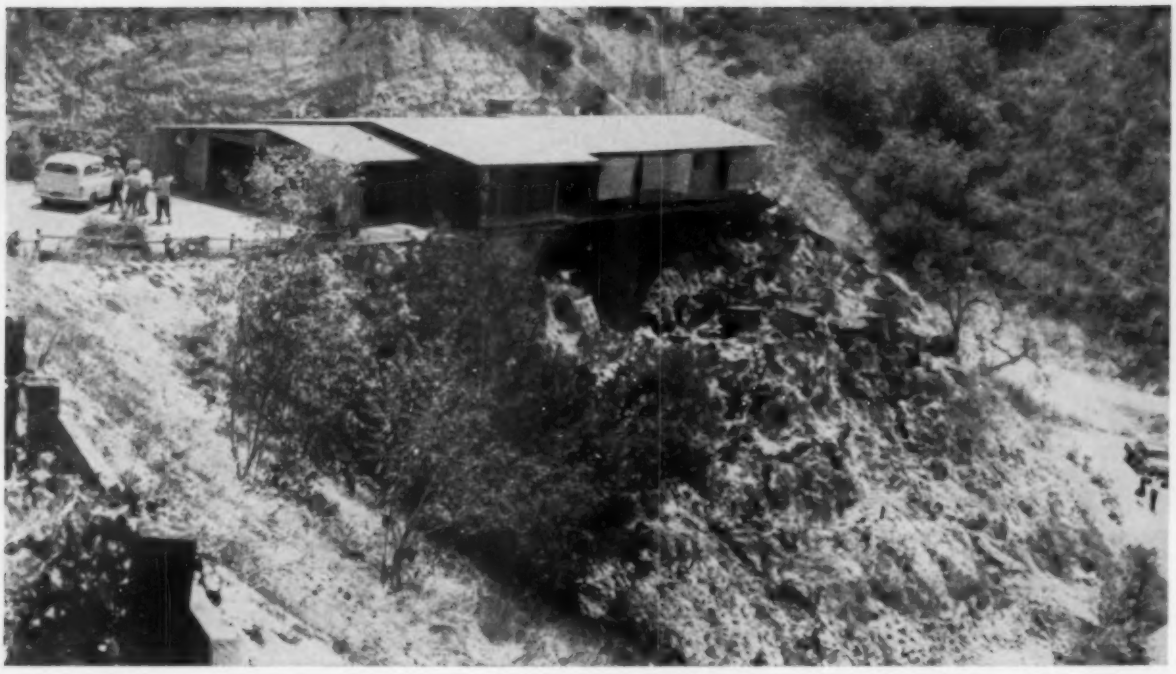
Before the earth was dry, letters and messages came from every direction urging enactment of a city ordinance to stop the unrestrained reshaping of mountains into dangerously steep cliffs and crevasses. The pressure was on. It became so great that several years later, Hanley Wayne, assistant chief of the Building Division of the Los Angeles Building and Safety Department, remembered it sufficiently to open an address on the subject to the American Society of Civil Engineers in this ironic vein: "I don't believe there's any individual in Los Angeles now who doesn't know that the Building Division regulates earthmoving on private property, because we've received letters from all of them!"

Within three weeks after the 1952 rainstorm, the city council had instructed the city attorney to prepare a grading ordinance that would protect private property from flood damage. The committee which drafted that first ordinance had representatives from nearly all the building trades. Home owners and city officials also were represented. The 1955 regulations are a natural outgrowth from this start, and already are attracting attention from cities not only



Fill for a residential development is brought in by an International tractor-scraper unit, moistened and then compacted with a pair of Cat-drawn sheepsfoot rollers.

A technician takes a sample of soil. Compaction must meet rigid specifications.



Foundations of this ranch house collapsed when heavy rains caused unstable fill material to slide downhill in a soft, soggy mass.

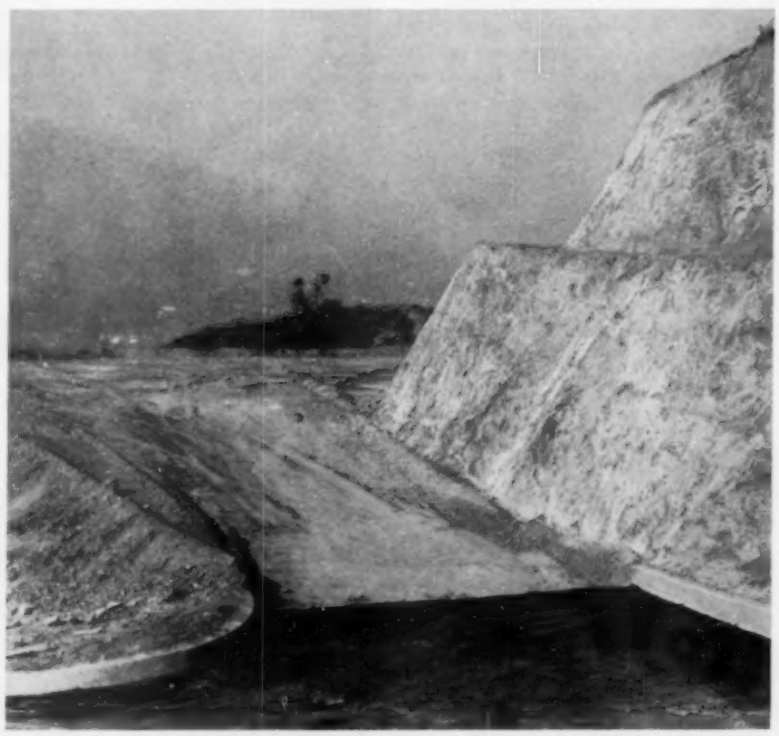
close to Los Angeles, but from all over the nation.

To engineers and lawyers engaged in drawing up the regulatory legislation, the problem and its remedy appeared ridiculously simple at first. A study of typical failures usually pointed up two glaring faults in earthwork. The slopes were too steep in many instances, and the fills were not sufficiently compacted. It was therefore natural to assume that correction of these deficiencies would solve the problem. That assumption wasn't necessarily so, and it did not provide the complete solution to all ramifications of the problem, according to Assistant Chief Wayne.

Key to Problem

In his ASCE talk, Wayne humorously put his finger on the key to the problem. "It has recently become clear that water flows only downhill," he told the meeting. "When this law was rediscovered, it led to many complications."

Studies are under way now to plan subdivision grading so that water from one lot does not drain over another, and so that the runoff from one subdivision does not drain through the next one lower in elevation. Also high in priority in the planners' minds is the necessity for having adequate storm drains to accept drainage water from ultimately higher property. Studies of critical and dangerous excavation areas, particularly along canyon sides, point up the necessity for possible curtailment of new subdivisions, unless storm drains through lower lying property are adequate. The new regulations adopted in November give positive control also of granite "mining" as a business, and require special approval by the Board of Building



A mountainside cut created a desirable building site here that affords a commanding view of the valley below. The steep face of the cut has been benched down for safety.

and Safety Commissioners for the exportation of more than 500 cubic yards of material from any one lot.

The regulations as finally adopted by the November resolutions are commonsense, fair precautions. The first regulation says clearly that grading will be permitted in hillside areas, but only for the purpose of preparing the land for building. Building is limited to only one main structure and accessory buildings on each lot, such as a garage. Moreover, the lot must be a lot of record in a recorded tract.

Exceptions Are Provided

To this basic provision there are two main exceptions. If the amount of earth to be moved is 500 cubic yards or less, removal is permissible. Also, an exception is made in the case of major subdivisions covering more than one lot, providing the developer of such a tract posts street improvement bonds and submits and has approved a set of plans and specifications for streets, sewers and storm drains. In granting a grading permit for such a development, the Building and Safety Department views the development in its broadest terms, so that the safety of individuals living in the tract is assured as well as the prevention of damage farther down as a result of the development.

The new regulations say that not more than 500 cubic yards of earth in one year shall be exported or imported from any single hillside-area lot, regardless of whether or not a grading permit is required. Not more than 20% more than the total yardage in a grading permit can be exceeded for exportation without express prior Board approval. It is this regulation which will halt mining of decomposed granite deposits, under the guise of a grading permit.

Other parts of the new regulations prohibit Sunday work on a grading project. Where trucks and equipment use streets and crossings used by school children, the grading operator must post crossing watchmen at points along the route where school children habitually cross. Regulations say further that the Board shall not authorize grading of more than 500 yards in one year in those areas deemed critical during the period of heavy rains from December to April.

Responsibilities of the Department of Building and Safety also are set forth in the regulations. For example, the De-

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The man on the firing line responsible for enforcement of Los Angeles' strict new earthmoving regulations is Hanley A. Wayne, assistant chief of the Building Division.

A sewer line is installed in flat country below a hillside subdivision. The sewer line prevents flooding in this low area.

Working in the shadow of the everlasting hills, a ¾-yd. dragshovel excavates a rocky sewer trench in a Salt Lake City suburb.

Salt Lake's 250-Mile Sewer Program

by Ray Day

SALT Lake County, Utah, was up to its neck in a major sewer-building program during 1955.

All over the county, but especially in residential sections which ring the city to the south and east, work was under way. Five contractors were kept busy in the shadow of the everlasting hills. In many spots, heavy boulders forced equipment to earn its keep. Ground water was often a serious problem.

Nobody has estimated the amount of excavation which is still necessary to finish the enormous project. But, according to the Salt Lake consulting-engineer firm of Caldwell, Richards & Sorensen, which designed the program, the system will be between 250 and 300 miles long, including service laterals, and will cost close to $8 million.

The work has been handled in the best tradition of design, financing and contracting. It is being paid for by a combination of taxation and revenue bonds, with revenue bonds paying mostly for main lines. Taxation was authorized by the 1953-'54 Utah state legislature,

As Salt Lake's population spreads beyond city limits, Salt Lake City suburban sanitary districts contract to build an $8 million major sewer system involving rugged excavation throughout.

which okayed a four-mill levy to help pay for the badly needed construction. Actually, the financial history goes back farther than that, to 1947, when the sanitary districts were first organized. But actual construction was deferred until 1954, pending clarification of some of the features of that enabling act.

Mushrooming Population

The population throughout the area west of the Rocky Mountains is increasing rapidly, and Salt Lake City with its environs is no exception. There are optimistic people in Salt Lake City who predict a total population of 1 million for the city and its environs by 1965. While that prediction may or may not be correct, sewage engineers know that much of the population has overflowed into Salt Lake county, toward the east and south. A look at this mushrooming residential community from the air shows hundreds of blocks of homes under construction.

When Alton H. Sorensen of Caldwell, Richards & Sorensen was appointed chief engineer of Sewer District 1, it looked like the District might serve about 10,000 families. In a period of less than two years that estimated number has increased almost by one fourth, and the growth factor may even be larger. In any event, the engineering firm designed the system in the best contemporary practice with future growth in mind.

An Ottawa Hydra-Hammer makes a clean break in pavement on the spread of Tiago Construction Co., Salt Lake City. The firm laid 60 miles of main sanitary sewer line.

Dirt and rock from a deep trench excavation are loaded to a Ford dump truck by an Allis-Chalmers HD-9 front-end loader.

At the present time, there are three sanitary sewer districts in Salt Lake county, of which District 1 is by far the largest. Construction was active during 1955 in two of these districts, but was most active in District 1. The work consisted of independent sewage-treatment plants and various types of sanitary sewers ranging from 42-in. diameter reinforced-concrete pipe down to 4-in. laterals connecting the residences to main lines.

The planners split the over-all job into a series of contracts arranged nicely for size. The first major contract was for the main sewer outfall line, which was awarded on the low bid of Paul Vukich and M.G.R. Construction Co. of El Monte, Calif. That work was pushed through rapidly during the late summer and fall of 1954 and was finished by June 1955. What Vukich and M.G.R. found out in laying the main outfall was an indication of what other contractors might be up against, because everything from cemented gravel to heavy ground water was battled in that contract.

Five Contractors

Other 1955 contracts included a main line construction job which was awarded to Schmidt Construction Co., Arvada, Colo., with the work being done by its subsidiary, Tiago Construction Co. of Salt Lake City. Statewide Plumbing & Heating Co., Inc., Murray, Utah, had another of the contracts for sanitary sewers and laterals. Kloepfer Construction Co., Logan, Utah—a firm which specializes in pipeline and sewer construction—also had a contract for main lines and laterals. In another section of the District, Hilton & Carr Construction Co., Ogden, Utah, was active on the same general type of work being done by Kloepfer. All of the contracts were engineered and inspected under the

general supervision of the consulting-engineer firm which designed the project.

In District 1, as in other districts, Caldwell, Richards & Sorensen organized an easy, workable method for dealing with the general public. The engineering firm established a field office for the convenience of property owners interested in hooking on to sanitary sewer service. With a minimum of delay, property owners came to the field office, filled in necessary application forms and went on their way again assured of sewer service. Construction work on the lateral systems under the various contracts took 4 and 6-in. lines into the various parcels of private property, so that private plumbers could quickly hook on to these works.

Identical Problems

In many respects, each of the several contractors faced almost identical construction problems. Excavation difficulties, formations, material supply, job organization and public relations problems were similar. Not the least of these problems was the one centered around public relations. In every case, the contractors kept their jobs closed up tight —sometimes as short as 200 feet—simply to keep people from complaining to District officials. It was not always the most efficient way of running this type of job.

It might have been easier to open up longer sections, have more work active

(Above) A tapered trench is cut through sandy material. (Below) Two laborers work ahead of a Cat D7 dozer shoveling in soft dirt to protect newly laid pipe joints.

at one time and have the organization so arranged that a machine used on backfill, for example, might work a larger percentage of its day than was characteristic under this program. But as a public relations and safety gesture, all the contractors had to keep backfill equipment standing by, sometimes idle, as the sewers were laid.

Formations, too, had a certain similarity. One of the worst formation problems was ground water, which is typical throughout the entire high eastern bench and the marshy country to the south of Salt Lake City. When Brigham Young and the first band of Mormon pioneers came to Salt Lake in 1849, the Mormon leader visualized irrigation of many acres of land on these benches from water resources in canyons leading down from the hills. But excess irrigation in some cases, and natural ground water in others, have caused a build-up of ground

A Kloepfer H-3 Hydrohoe mounted on a White half-track virtually eliminates hand labor where laterals are dug next to utility lines.

water levels throughout this entire area. Thus it was that the new sewer sometimes lay as much as nine feet below ground-water level, creating a very real dewatering problem all the way as construction passed through such places. All contractors had to staff themselves heavily with pumps, so that various areas could be unwatered as work went on.

Other problems centered around naturally tough digging formations. Large numbers of boulders and gravel formations showing slight cementation made for very tough excavating. Other formations included hard clays, sand and muck. In many places the ground was waterlogged and quaking, so that backfill was quite a problem.

On all construction contracts, methods in getting the quality of workmanship were left fairly much up to the individual contractors concerned. This was done by establishing maximum infiltration criteria for a given section of pipeline, regardless of whether the line was vitrified clay, concrete or Transite. In most places the main lines consisted of vitrified clay pipe with a ring of jute and hot asphalt poured to complete the joints. This type of joint, constructed in accordance with good practice, held infiltration pickup to the minimum established by the construction specifications.

In order to determine how ingeniously

Another Kloepfer job innovation is this metal skip used for placing bedding gravel in trenches where cushion material is needed. The skip is loaded by gravity dumping.

A LeTourneau-Westinghouse C Tournatractor and an Austin Western motor grader build a new road behind one of the sewer crews.

each of the several contractors handled these problems, *Excavating Engineer* visited all of the important contracts to see what methods and construction ingenuity were being used on each spread.

Toughest Job

Of all the construction contracts in force during the 1955 working season, none was more difficult than the job which Tiago Construction Co. was doing in conjunction with Schmidt Construction Co. of Arvada, Colo. The Tiago job, which called for 60 miles of main sanitary sewer line and 40 miles of lateral, was located in the general area from 9th Street east to Wasatch Boulevard and north of 4000 South Street. The main line system in this contract ranged from 8 to 18 inches in diameter, and all laterals were four inches in diameter. Average depth of trench was 11 feet, with a maximum trench depth of 20 feet. Formations included hard clay, hardpan, cemented and uncemented gravel and a considerable stretch of wet, waterlogged sand. The hardpan was some of the most difficult digging on the entire system.

Tiago staffed up with equipment especially designed to do the various parts of its job. For lateral work, the company brought in a Buckeye Model 407 ditching machine and a small labor crew, and then let the work out by subcontract. For ditch construction and some of the easier digging clays, a Buckeye Model 160 and a Parsons Model 310 machine were used. As excavation became harder, dragshovels were brought into play, starting with a Northwest ¾-yd. Model 25 and a Bucyrus-Erie ½-yd. 15-B. In the very toughest digging, two Bucyrus-Erie ¾-yd. 22-B's were used. The Northwest 25 and the Bucyrus-Erie 22-B's were effective, even in very hard digging 18 feet below ground surface, according to the contractor.

Other equipment on the Tiago roster included an Allis-Chalmers HD-9 with a front-end scoop, three Allis-Chalmers HD-5's and a Hough Payloader. This equipment was used to backfill the trench and to load out excess dirt, wherever necessary, left over from the excavation. The company also used several Littleford hot kettles for heating asphalt to fill the joints.

Methods of construction on the Tiago spread can best be described as an application of brute force to get the pipe down as rapidly as possible. Since the sanitary sewer system lies at great depth, it intercepts just about every other utility line laid through the area. The presence of these intersecting lines was a never-ending problem. General Superintendent Jack Cook of Tiago tried to stay ahead of each of his equipment units by locating all known utilities lines. But even so, it was necessary for the firm to use the greatest caution to keep from breaking high-pressure water lines and gas mains. The presence of a layer of hardpan over many of these locations made excavating doubly difficult.

Schedules Slowed Up

Cook nevertheless set production schedules around an average of 350 feet per day per unit. Under easier digging conditions where street pavements, buried utilities and other impedimenta dropped off, the units were able to account for footages up as high as 700 feet. But 500-ft. averages for any machine on the line were considered exceptionally good.

Most of the main line pipe for this job came from Utah Concrete Pipe Co., Salt Lake City. Pipe deliveries were so arranged for minimum storage time alongside the job. As the various ma-

chines excavated the trench, a small labor force did the necessary fine grading. Worthington and Gorman-Rupp pumps dewatered, as necessary, just ahead of lowering in the pipe sections. As each section was laid, the jute ring was tamped in by plumbing tools, a sealing rope was wrapped around the outside of the joint and hot asphalt was poured in. Other workmen, moving behind the pipeplacing crew, hand-shoveled dirt over the entire pipe before backfilling began. After the backfilling was in, the trench was thoroughly flooded by hauling water in with tank trucks and applying the loads under pump pressure through a water jet. This water jet delivered water throughout the entire fill from bottom to top.

Tiago's contract, like all the others, included construction of laterals and replacement of the street surfacing after all the excavation had been done. By keeping the work closed up as much as possible, many complaints, which are normal in residential sections where pipeline work is done, were eliminated.

The company with the heaviest boulder excavation was probably Hilton & Carr Construction Co., whose 20-mile contract was located in the extreme southerly end of District 1. In this 20-mile job, a 10-ft. depth of trench was average, with maximum depth as great as 17 feet. On main line work, the company was placing 8, 10, 12 and 15-in. diameter concrete pipe, with 4 and 6-in. laterals. Organization, delivery of pipe and the method of keeping the project tightened up within a short distance were similar to the Tiago spread previously described.

Backhoes Dig Trenches

Somewhat different equipment was used by Hilton & Carr. All trench excavating equipment was composed of machines of the backhoe type. There were a P & H ¾-yd. Model 255-A backhoe, a ¾-yd. Unit machine and a ½-yd. Austin-Western Badger. For lateral work, this company used two Schramm diggers on pneumatic compressor-type tractors. Since dewatering was a major problem throughout the Hilton & Carr job, about 10 Gorman-Rupp and Worthington pumps were needed. For trench backfilling, an International TD-18 and a TD-9 with a bucket loader were employed.

When the pictures for this article were made, the P & H machine was battling large boulders and tough-digging gravel about five miles south of the city limits, in the residential section which has grown up over an old alluvial fan below the mouth of a canyon. It was slow, brutal business as the machine reached down to excavate the trench. Pumps had to be moved constantly to remove the water which immediately ran in. Pipe crews followed as fast as possible. In all cases where deep trenches were dug in unstable material, bracing was installed in accordance with Utah safety codes and was snugged up tight by mechanical trench jacks. There were

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Evidence of tough digging is shown here as a ¾-yd. P & H 255A works in background and International TD-9 dozes in backfill.

News from the Field

A dam builder, Harvey Slocum (left) of California, and a tunnel digger, Howard King of New York, examine awards presented to them at the annual Moles dinner.

King, Slocum Honored

High honors from the field of heavy construction were accorded to Howard Langdon King and Harvey Slocum at the annual awards dinner of The Moles in New York in February.

King, of Port Washington, N. Y., and Slocum, of Alhambra, Calif., became the 16th pair of recipients of the Moles awards, given annually to one member and one non-member, for outstanding achievement and contributions to the art of heavy construction—tunnels, dams, bridge foundations, atomic-energy plants and the like.

Benjamin F. Fairless, president of the American Iron and Steel Institute, made the principal address at the dinner.

The non-member award presentation to Harvey Slocum, almost invariably introduced as "the best dam man in the world," was made by Charles D. Riddle of Walsh Construction Co. Slocum has been responsible for the pouring of between 19 and 20 million cubic yards of concrete in the building of many of the nation's most famous dams. He was in this country on a short leave from his job of supervising construction of Bhakra Dam in India, largest dam in the Far East.

Vice President Richard Nixon sent a telegram of congratulations to Slocum at the banquet.

The member award presentation to King, vice president and chief engineer of Mason and Hanger Co., was made by Miles Killmer of that company. King, who was born in New York City and holds degrees from City College of New York, Columbia University and Massachusetts Institute of Technology, has distinguished himself particularly in compressed-air subaqueous tunnel work through a long career. He has played an important part in many of the best known underwater and underground routes by which millions of human beings move to and from the island of Manhattan, including all three tubes of the Lincoln Tunnel, the Brooklyn-Battery Tunnel and the Holland Tunnel.

Calaveras Quarry Flooded

Calaveras Cement Co. crews drained 400 million gallons of water from the company's quarry without the loss of productive work after the disastrous California storms in December.

Water rushed into the quarry one night when nearby Old Gulch Creek broke its banks. For nearly a week, until a diversionary channel could be dug, the flow was at the rate of 200,000 gpm. The possibility of flooding had been recognized and all equipment had been removed from the quarry floor.

The diversionary channel was about half a mile long and 15 ft. wide and 10 ft. deep. Quarry crews worked day and night in driving rains, using tractors, shovels and explosives to build 2,000 feet of levee and 500 feet of canal.

The company searched northern California for pumps; 18 were found, including some borrowed from tugs in San Francisco Bay. A month after the flooding, the last of the water had been drained out and quarry operations were normal.

The flood did not affect operations at the Calaveras plant. Adequate supplies of rock were on hand to keep wheels turning. Shale, limestone and overburden were removed from locations on high ground.

During the entire period of emergency, the company's $4 million plant expansion program moved forward at accelerated pace.

Old timers in the plant area could not recall ever seeing Old Gulch Creek overflow its banks, although they remembered tales of similar high waters some 80 years ago.

Highway Board Picks Woods

Kenneth B. Woods, head of the school of civil engineering, Purdue University, was elected chairman of the executive committee of the Highway Research Board in Washington, D. C. at its 35th annual meeting during the winter.

Woods, who also is director of the

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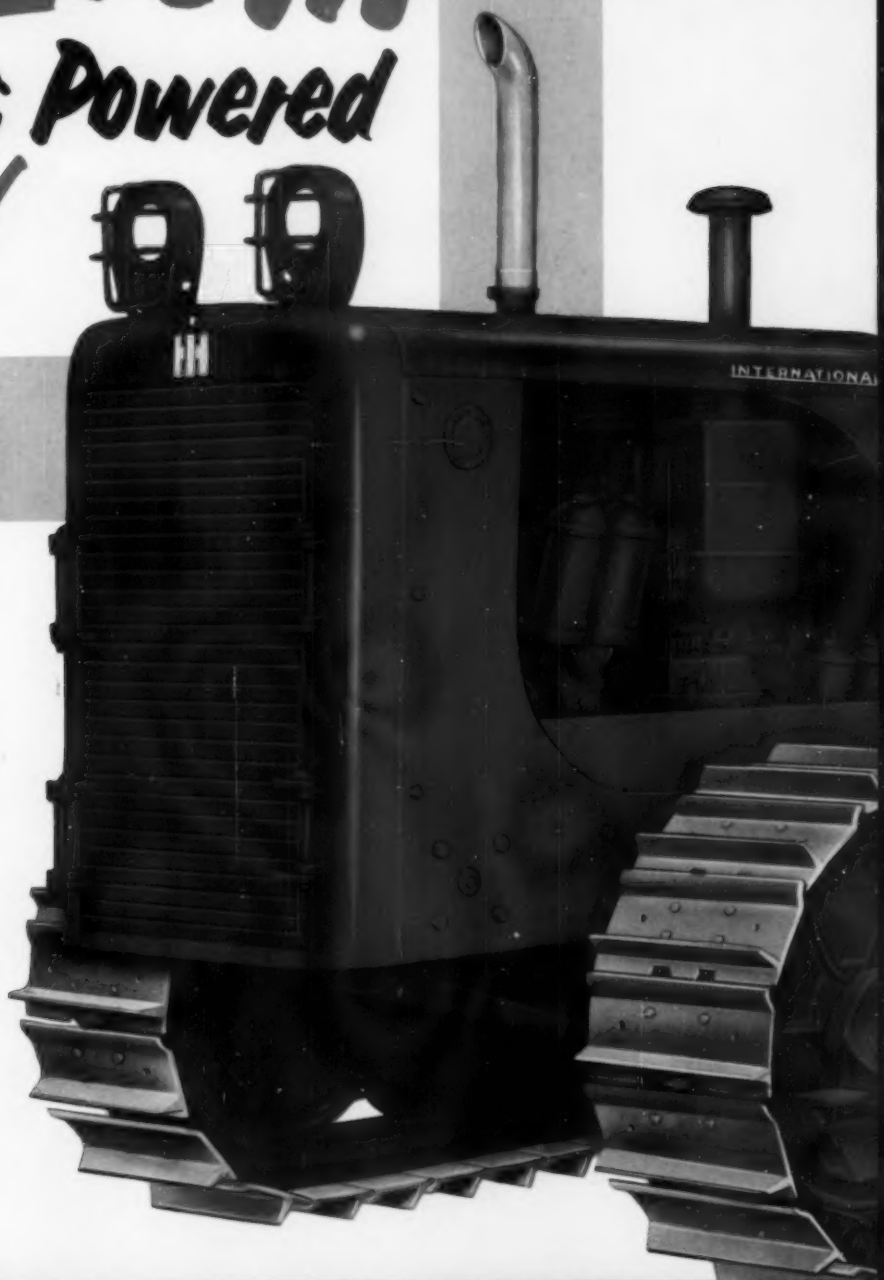
NEW...

Bonus Powered too!

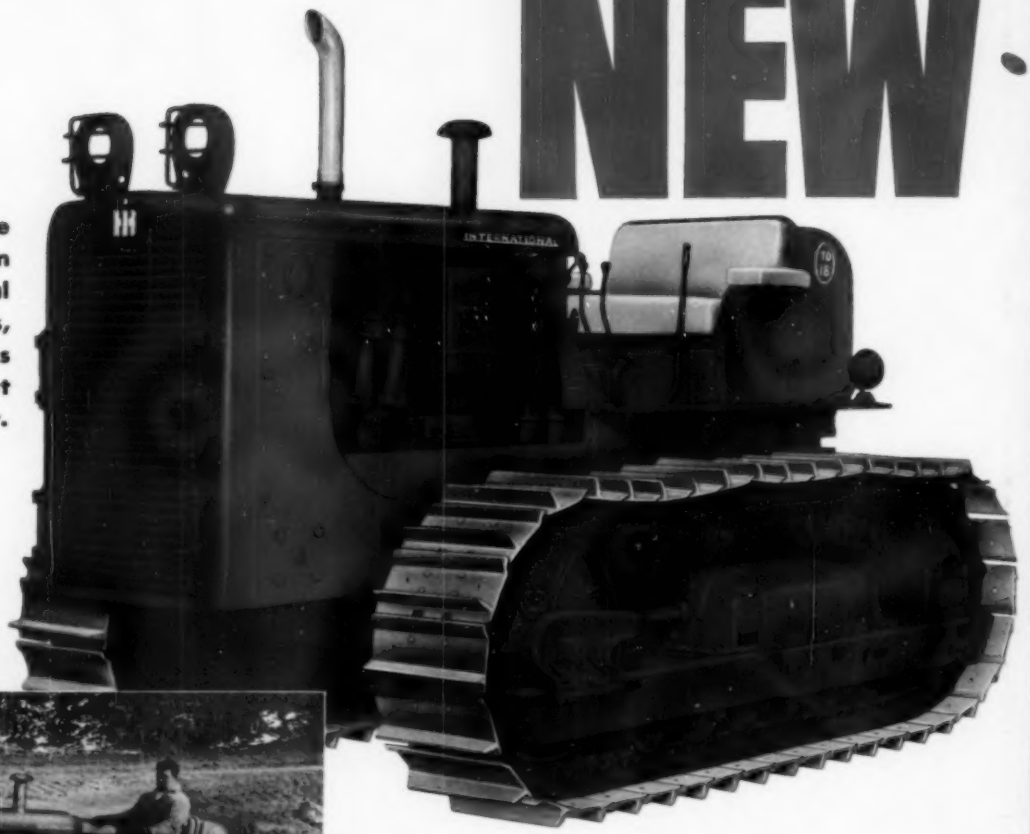


NEW

124 Net Engine Horsepower. In International Drott Machines, Engine develops 134 Net Horsepower.

182 Series

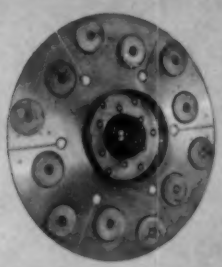
TD 18



TD-18 diesel (series 182) delivers 103 drawbar horsepower, with weight of 29,050 pounds (without equipment). All-weather electric starting, standard equipment. "New look" visibility, operating ease never before available. New heavy-duty, swinging-door type radiator guard is "standard"—for carrying heavy front-mounted equipment. Gives big tractor performance in pioneering under roughest conditions. Powers 3-yard International Drott Skid-Shovel, anywhere.

No costly delay from a "killed" or cold engine—you start fast! Famous International *gasoline-conversion diesel starting—actual* "in-seat" starting—is *standard equipment* on this new crawler line. With "push-button" ease, you get seconds-fast starting, whether the engine is cold, or stopped! And you're on the job seconds-fast, when minutes are dollars.

Cerametallic Engine Clutch Facings Save power, defy heat, prolong life! Uncomplicated, *familiar-to-all* engine clutch design of these new crawlers have *power-holding, heat-defying, long-lasting* Cerametallic facings. These facings reduce lever-pull up to 50%, provide amazing heat immunity, add service freedom, cut upkeep!



New . . . 500-hour lube intervals with new metal-to-metal, track roller seals! You save the time and expense of frequent inspections or lubrications, with the new *full-floating*, cartridge-type, track roller seals provided on the TD-24, TD-18, and TD-14. These precision-lapped, metal-to-metal seals are so effective they give you *safe* 500-hour intervals between roller lubrications!

Steps up a size... in job range and capacity!

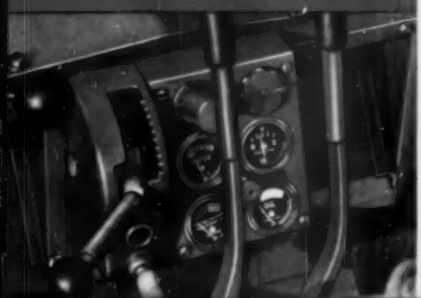
50 Net Engine Horsepower. In International Drott Machines, Engine develops 55 Net Horsepower.

61 Series

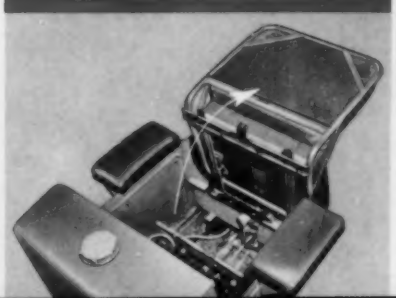
TD 6

TD-6 diesel (series 61), 41.5 drawbar hp, up 23%! Steps up a whole size in work capacity and earning ability. Operating weight (5-roller model), without equipment, 8,890 pounds. Powers 1-yard International Drott Skid-Shovel or Four-In-One; serves as clean-up dozer unit on any-sized contract; versatility and low operating cost to do many sizes of jobs for every size of contractor.

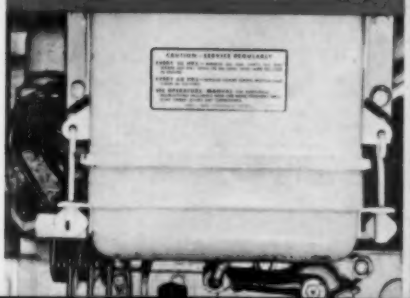
Full-view, one-glance panel saves time—cuts effort! One quick glance at this new full-view panel, with centralized instrument grouping, gives the operator the instant check-up, to assure that lubrication, generator, and cooling system are "perking" for full production!



New Fold-over Seat Aids Fast, Centralized Servicing! New fold-over seat of the TD-6 and TD-9 models allows operator to give you the time and convenience advantages of centralized steering clutch assembly servicing. Lubricant fittings are conveniently grouped and fully accessible!



Thorough air filtration assured by new under-hood cleaner! Instead of being "in your lap," or a knee-bumping obstruction, air cleaners of the new International crawlers are side-mounted—for easy accessibility, yet out of the way. They have big capacity and high efficiency, too, for positive air filtration!



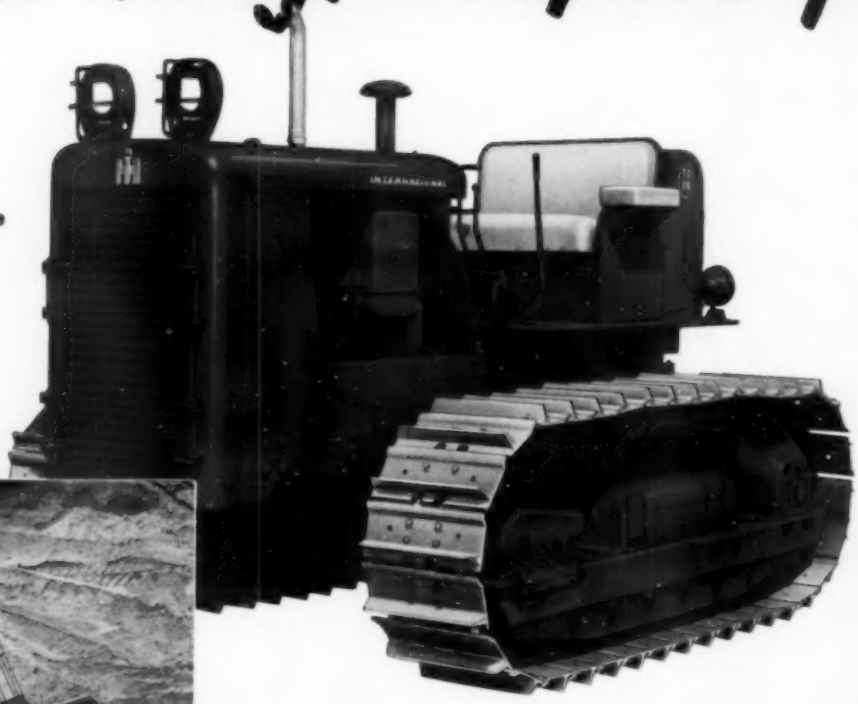
..International® Crawlers *g*

plus new design to speed y

95 Net Engine Horsepower.

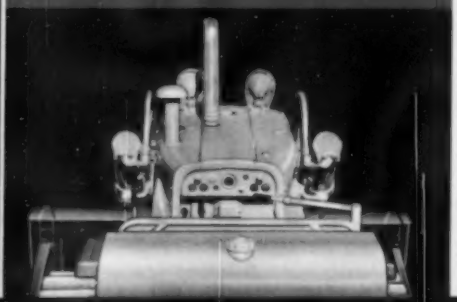
142 Series

TD 14

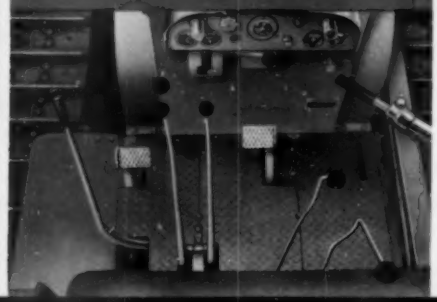


TD-14 (series 142), 78.5 drawbar hp; weighs 21,095 pounds (without equipment). Features "new look" engineering, job-speeding visibility, new equipment-carrying and operating strength. All-weather electric starting, standard equipment. It's a fast, responsive, big-capacity dozing tractor. Powers 2¼ cu. yd. International Drott Skid-Shovel or Four-In-One; 15-ton capacity Superior Pipe-Boom; other similar-sized equipment.

Control Tower Visibility adds operating efficiency! See how new International crawlers are streamlined for complete job-control visibility. Seat is amply high to provide full view of equipment, terrain, and variations requiring operator action, to maintain efficiency.



Clean, safe deck cleared for action! Look down on that safe, clean, flush deck —a platform for full production. The wide, man-size seat is fully-adjustable; foam rubber padded. Instruments centralized for one-glance check-up! Even a cigarette lighter is provided, to prevent needless stops!



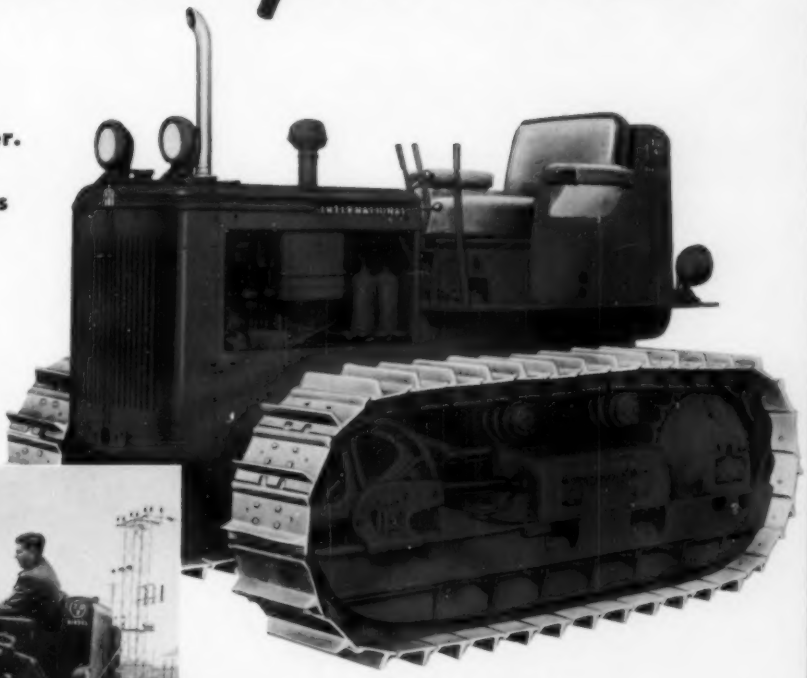
Pressurized Closed Cooling System for Positive Performance Protection! New pressurized cooling systems provide fast warm-up under thermostatic control—and positive *ideal temperature control* with forced circulation through full-length jackets. That aids clean combustion, guards oil film strength, protects performance. Radiator core assembly is easily-removable, without disturbing radiator guard or mounted equipment.

...give you Bonus horsepower—...your jobs, control your costs!

66 Net Engine Horsepower. In International Drott Machines, Engine develops 71 Net Horsepower.

91 Series

TD 9

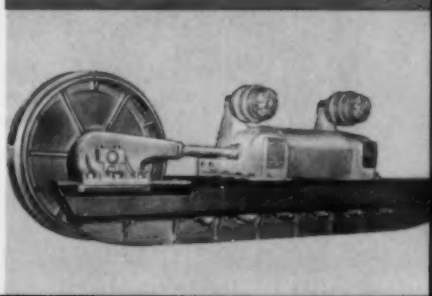


TD-9 diesel, (series 91), delivers 54.5 drawbar hp—up 32%. Operating weight (5-roller model), without equipment, 12,000 pounds. Now up in a new heavy-duty job range. New power is backed by new power train and track frame strength, new operating and servicing ease. Powers International Drott 1½ cu. yd. Skid-Shovel and other equipment requiring similar power.

480-hr. full-flow lube oil filters guard bearings, cut upkeep! Every drop of oil on its way to lubricate moving engine parts must pass through these new abrasive-trapping micron-type filters—with the capacity, strength, and efficiency to give 480 hours of wear-fighting, upkeep-cutting duty!

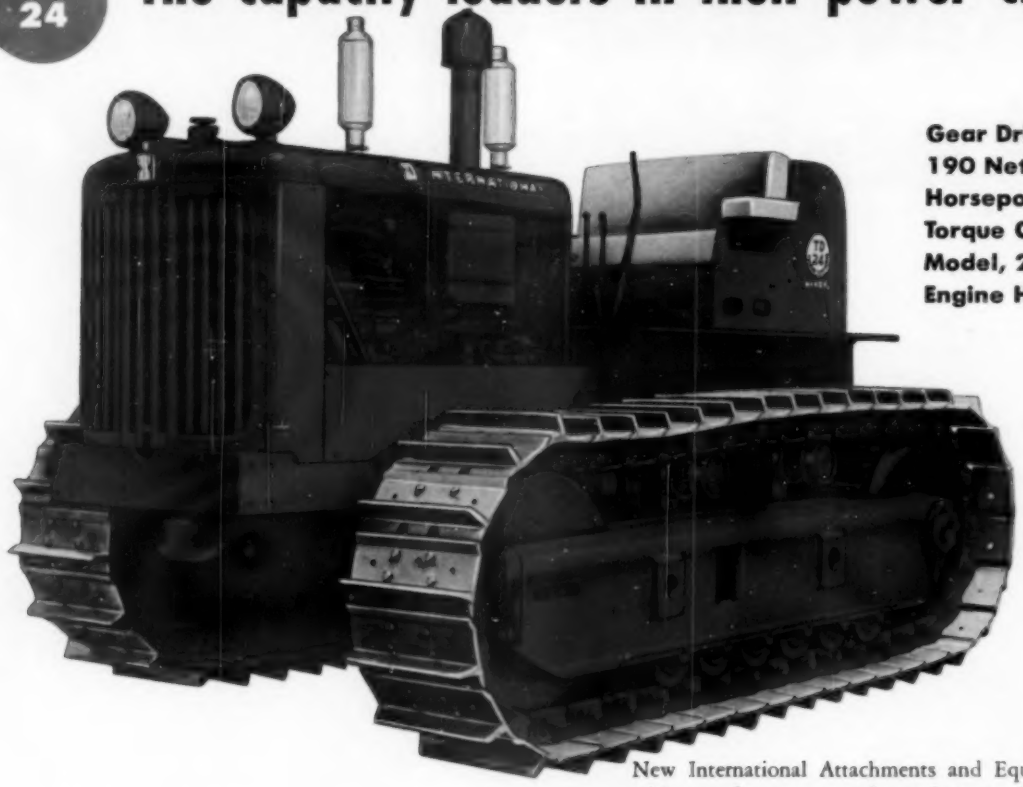
Hydraulic Power Steering inspires Operator Cooperation! New hydraulic power steering of the TD-14 and TD-18 cuts operator fatigue—and along with the other big effort-saving advantages, makes it easier than ever to deliver full-capacity production! TD-6 and TD-9 have spring boosters to lighten the operator's job.

"Bridge-strong" track frames for "slam-bang" conditions! You are looking at the strongest track frame in the industry for crawlers of TD-18 and TD-14 size! Heavy steel box-section beams, weld-joined to heavy stress-relieved steel plates—and rigidly gusset-braced—they're your foundations for record-making "rough-and-tumble" performance!



TD 24

The capacity leaders in their power class



Gear Drive Model, 190 Net Engine Horsepower
Torque Converter Model, 200 Net Engine Horsepower

Massive—with 43,080 pounds of rock-dozing, scraper-pushing brawn (7-roller torque converter model)*—the TD-24 can give them all a lesson in operating ease, big capacity, and positive load control! Has instant high-low range and exclusive Planet Power steering to give you its tremendous *pushing*, *pulling*, and *lifting* power on any terrain—with responsiveness not available elsewhere! *Live power on both tracks, on every turn!* Backed by equipment engineered to match its strength and power!

*Gear Drive 7-roller model weighs 42,780.

New International Attachments and Equipment team with new bonus-powered crawlers to give you high-producing performance packages: 42 new Bulldozers, to fit your needs exactly . . . 4 new Drott Loaders, 1 to 3-cubic yard capacity . . . 4 new Superior® Pipe-Booms, 8 to 55-ton capacity; 3 job-proved PCU'S! . . . **Measure . . . compare . . . prove to yourself . . . new bonus-powered International crawler tractors beat anything else on tracks! Try this turnpike-paced new power for capacity, operator preference, profit potential. Ask your International Industrial Power Distributor for a bonus-powered demonstration to *your specifications!***

INTERNATIONAL HARVESTER

International Industrial Power

INTERNATIONAL HARVESTER COMPANY, 180 N. Michigan Ave., Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-tired Loaders . . . Diesel and Carbureted Engines . . . Motor Trucks.

Bushy Park, located in South Carolina between Cooper (right) and Back rivers (left), will yield large industrial water supply.

News . . .

Continued from page 40

Joint Highway Research Project at Purdue, succeeds G. Donald Kennedy, who had served as board chairman for two years. Kennedy is president of the Portland Cement Assn., Chicago.

The Highway Research Board, which operates under the auspices of the National Academy of Sciences and the National Research Council, is a cooperative organization of highway engineers and technicians. Some 1,500 highway administrators, engineers and highway transportation and safety experts from throughout the United States, and representatives of national organizations, federal agencies and county and city highway departments attended the meeting.

Woods, a native of Washington state, has been at Purdue since 1939 and has occupied his present position there since July 1954. He received engineering degrees from Ohio State University in 1932 and 1937 and was with the Ohio Department of Highways prior to going to Purdue.

In 1949, Woods was given the Highway Research Board's distinguished service award for outstanding achievement in the highway field. He has been a member of the consulting board of the Army Corps of Engineers since 1948 and also is on the board of directors of the American Society for Testing Materials.

Author of more than 100 technical papers and university bulletins, Woods' other activities include consulting work on permafrost and earthwork for many railroads in the United States.

Bushy Park Project

A spectacular transformation is taking place in the section of the South Carolina low country known as Bushy Park. The transformation will enable Bushy Park to yield 10 million gallons of fresh water daily.

A "freak" of geography plus a bold step by the mayor of Charleston, S. C., are responsible for the engineering project that will create the large reservoir. With this supply of water, South Carolina hopes to attract new industry.

Charleston became disturbed a few years ago because a hydroelectric plant 40 miles upstream was discharging 10 million gallons of fresh soft water daily to no apparent avail. Once the water was finished making power, it swept into Charleston harbor and out to sea. The water was unfit for industrial use because salty sea water running up the Cooper River on each incoming tide contaminated it.

But an engineering scheme devised by Arthur M. Field, a Cornell-trained engineer, and pushed into reality by Mayor William McG. Morrison of Charleston provided the answer to "reclaiming" the water for industrial use. The plan meant a reshuffling of rivers, but the potential cost was very small. The Bushy Park water project began to unfold.

The plan calls for diverting the 10 million gallons flow from the power plant into Back River, a short parallel stream, by means of a canal. Back River will be closed at its lower end by an earth-fill dam. This dam will serve a two-fold purpose, forming a barrier to block salt intrusion into the fresh water reservoir and carrying a railroad spur connection from the area to the mainline of the Seaboard Airline Railroad. The dam also will carry a highway, giving access to the Bushy Park area from the South.

The Bushy Park fresh water reservoir will be located adjacent to a 35-ft. deep ship channel.

The Cooper River, which borders the potential industrial sites, offers a means of effluent disposal without expensive treatment.

Mayor Morrison's first move was to learn the cost of the project. The cost, $4,500,000, was astonishingly low, he discovered.

The South Carolina general assembly

Continued on page 50

5 "Euc" REAR-DUMPS

10-Ton

The Model UD has a 6½ cu. yd. body and rated payload of 20,000 lbs.—a quarry body with flared sides is available for rock work. Designed for smaller mine, quarry and construction work, this Rear-Dump has a 128 h.p. engine and 10-speed transmission providing a top speed of 36 m.p.h. Drive axle is spring mounted—tires are 11.00 x 24 front with 12.00 x 24 rear duals.

15-Ton

There are two models of this capacity "Euc". One has a 10 cu. yd. body, 165 h.p. engine, semi-rigid drive axle and manual steering—the other has a 218 h.p. engine, 10½ yd. body, spring mounted drive axle and hydraulic steering. The latter model can be equipped with larger tires to increase the rated payload to 18 tons. Both have 5 speed transmissions and 14.00 x 24 tires standard—a quarry body for either model is available.

22-Ton

Practically a "standard" on larger quarry, mine and heavy construction projects, the Model TD "Euc" has a 300 h.p. engine, spring mounted drive axle, and 15 yd. body. Tires are 14.00 x 24 front with 18.00 x 25 duals rear. Hydraulic steering is standard, and a quarry body is available. This "Euc" can be equipped with a 10-speed transmission or Torqmatic Drive—it's a top performer on the toughest jobs.

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

10 to 50 TONS—128 h.p. to 600 h.p.

A Complete Line of Off-highway Haulers

34-Ton

This Twin-Power tandem axle "Euc" has two engines providing a total of 400 or 436 h.p.—each engine drives an axle through a separate Torqmatic Drive. The exhaust heated body has a capacity of 24 yds. Tires are 16.00 x 25 front, with 16.00 x 25 rear duals in tandem. For jobs where large loading equipment is used and big loads must be hauled, the Model FFD has no equal for low cost production and performance.

for

CONSTRUCTION, MINE, QUARRY and INDUSTRIAL WORK

Rear-Dump "Eucs" are the outstanding choice for moving heavy excavation on the toughest jobs because they are built exclusively for off-the-highway service. They have the capacity, power and speed to haul big loads faster and at lower cost per ton or yard moved.

The simple, rugged construction of Euclid Rear-Dumps pays off in long life and low maintenance cost. There's less down time for repairs . . . more work-ability. These "Eucs" have engines of 128 to 600 total h.p. . . . single and tandem drive axles . . . standard or quarry type bodies . . . gear transmissions and Torqmatic Drive . . . spring mounted and semi-rigid drive axles . . . top speeds, with full payload, up to 36 m.p.h.

Wherever you see Rear-Dumps in off-highway work, it's almost a sure thing they are "Eucs" because Euclid has been the leader in this field for over 20 years. There are more Rear-Dump "Eucs" in service than all other makes of off-highway haulers combined. Have your Euclid dealer supply helpful data on this complete line of Rear-Dumps and other Euclid earth moving equipment . . . you may find, as hundreds of owners already have found, that ***Euclids are your best investment.***

50-Ton

Largest Rear-Dump hauler in standard production, the Model LLD Euclid is designed for the biggest, toughest jobs. It has two engines, providing a total of 600 h.p.—each of the spring mounted drive axles is driven through separate Torqmatic Drives. The exhaust heated body has a 32 yd. capacity. All tires are 18.00 x 33. Twin Euclid hoists have ample power to raise the fully loaded body fast for quick, clean dumping.

Rear-Dump "Eucs" are your best bet

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Continued from page 47

in 1953 created an eight-member Authority to administer the Bushy Park project. Mayor Morrison was named chairman. Under his guidance, Charleston's city council approved a $1 million bond guarantee in 1954, with the Authority scheduled to issue long-term revenue bonds for $3.5 million.

The construction of the dam is an interesting aspect of the project. The material used to form the dam, known as "Cooper marl," is being dredged from the river bottom. Ordinary marls are soft, earthy and easy to excavate. Often, they disintegrate in water. But not Charlseton's Cooper marl. It is soft and easy to dig, all right, but its composition is such that when exposed to air and water it acts like a natural mortar; the exposed surface case-hardens and becomes practically erosion-proof. This meant that the marl's availability at the site of the dam would eliminate the costly operation of bringing in fill.

The project is scheduled to be completed in July.

Laskey Heads AED

Stanley F. Laskey, president of Northwestern Equipment, Inc., Fargo, N. D., was elected president of Associated Equipment Distributors, the national trade association of construction equipment dealers, at the group's 37th annual meeting in Chicago in February.

Laskey, executive vice president of AED in 1955, has been in the construction field since his graduation from the University of Minnesota in 1920.

Laskey is a veteran of both world wars. He was discharged from the Army Air Corps as a Lieutenant Colonel in 1945. He served as North Dakota state commander of the American Legion in 1941-'42. He currently is a member of the domestic distribution committee of the U. S. Chamber of Commerce.

Stanley F. Laskey

AED members pledged at the meeting to campaign for acceptance and adoption of the federal highway program this year.

More than 3,400 distributors and manufacturers from the United States and Canada attended the five-day convention. They represented 690 distributor organizations and 309 manufacturers of construction equipment.

The proposed federal highway program was a dominant factor in major addresses given during the meeting. Members also were given the latest information for better methods and practices in the distribution of construction equipment.

AED adopted resolutions: 1, urging prompt Congressional action on the proposed federal highway program; 2, recommending the adoption of the Hoover Commission report on the sale of surplus property—primarily surplus construction machinery; and 3, urging that Congress reaffirm its stand of 1938-'39 on the exemption of retail establishments under the Fair Labor Standards Act.

In his acceptance speech, Laskey charged the Association with the responsibility of promoting the passage of an adequate national highway program. He also urged members to take an active part in resolving their home states' construction problems.

In addition to Laskey, other officers elected were: L. Miner Doolen, Telford Equipment Co., Lansing, Mich., executive vice president; H. D. Anderson, Rish Equipment Co., Bluefield, W. Va., second term as vice president; F. J. Fitzpatrick, Parker-Danner Co., Hyde Park, Mass., vice president; D. C. Campbell, Tractors and Equipment Ltd., Fredericton, New Brunswick, vice president, and J. R. Borchert, Borchert-Ingersoll Co., St. Paul, Minn., treasurer. Campbell is also the new director of Region 15 (Canada).

Installed as directors were Leonard Morrissey, Morrissey Bros. Tractor Co., Burlington, Mass., Region I (Connecticut, Maryland, Massachusetts, New Hampshire, Rhode Island, Vermont); Harold W. Reilly, Service Supply Corp., Philadelphia, Pa., Region III (Pennsylvania); Jack F. Davies, Tractor and Equipment Co., Inc., Birmingham, Ala., Region V (Alabama, Florida, Georgia, South Carolina, eastern Tennessee); John C. Anderson, Anderson Equipment Inc., Omaha, Neb., Region IX (Iowa, Kansas, Missouri, Nebraska); and Harold B. Benson, Road Builders Equipment Co., Memphis, Tenn., Region XIII (Arkansas, Louisiana, Mississippi, western Tennessee).

Directors re-elected for two year terms were John G. Lindner, Jr., Bark River Culvert and Equipment Co., Eau Claire, Wis., Region VII (Illinois, In-

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Arthur H. Symons

Arthur H. Symons, 743 Park Avenue, River Forest, Ill., a pioneer in the concrete construction equipment industry, died January 31 at an Oak Park (Ill.) hospital after an illness of six months. He was 83.

The founder of Symons Clamp & Manufacturing Co., Chicago, Mr. Symons had taken an active part in the business until his illness. He is survived by his widow, Rachel; two daughters, Mrs. Helen Jones of Anchorage, Alaska, and Mrs. Sally Brandt of Park Ridge, Ill.; and a son, John G. Symons, Dundee, Ill., vice president of the firm.

A native of Spiceland, Ind., Mr. Symons, was graduated from Kansas University in 1898. In 1910 he founded the construction equipment firm. Mr. Symons was a charter member of the Northwest Industrial Assn. and a member of the Illinois Industrial Assn.

Get Extra Digging Speed

With Hydrohoe's Triple Action Bite

The BUCYRUS-ERIE HYDROHOE gives you three separate and distinct digging motions that not only boost your output but give you many other exclusive advantages, too.

In the primary digging force the dipper is pushed through the conventional dragshovel arc by means of a powerful hydraulically operated ram. This not only gets rid of drag ropes that wear out, but also eliminates a dipper bail which can interfere with filling, and sheaves which jam up with stones and dirt.

A secondary digging and positioning force is obtained by retracting or extending the telescoping boom by means of a double-acting ram. Boom can be retracted or extended a distance of three feet. This permits operator to wedge the dipper against a bank, to dig sharp corners, to level trench floors and to dig around obstacles — and also cuts lost time moving up by as much as 40 per cent.

Still another digging force is the Hydrohoe's powerful wrist-action dipper. Dipper is hinged at lower end of dragshovel and rotates through a 65° arc by means of hydraulic ram. Dipper can be positioned so that teeth bite in at the best angle — and rotated so that dipper can load quickly, be in "face up" position during swing to prevent spillage.

Complete hydraulic control of all digging actions gives operator the control that helps avoid damage to buried pipe and cable.

Your Bucyrus-Erie distributor will be happy to demonstrate many other advantages of triple action bite — show you the four dippers which give the Hydrohoe a job range that's unmatched anywhere. See him soon!

122H56C

BUCYRUS ERIE

South Milwaukee, Wisconsin

News . . .

Continued from page 50

diana, Michigan, Wisconsin); and Beal Shaw, Shaw Sales and Service Co., Los Angeles, Calif., Region XI (Arizona, California, Nebraska).

Charles C. Tambornino, George L. Ryan Co., Minneapolis, Minn., was named to a one-year term as director of Region VIII (Minnesota, North Dakota, South Dakota).

Four major business sessions, attended by both distributors and manufacturers, were held.

Ray J. Finn, retiring president, said that the AED had experienced continual growth along with construction.

Guest speaker George Koss, Des Moines, Iowa, president of the Associated General Contractors of America, said that " . . . the construction industry has a responsibility for 1956 just as it has had for the years past—and that is to provide a physical plant for the needs of our people."

Theodore Koop, journalist and director of news and public affairs in Washington, D. C., for the Columbia Broadcasting System, predicted that Congress would enact a highway aid program this year.

In a presentation ceremony closing the first business session, Morton R. Hunter, Sr., of the Hunter Tractor and Machinery Co., Milwaukee, Wis., one of the founders of AED, was awarded a bronze plaque for having served the Association and the industry for more than 25 years.

AED's Industry Round Table used "The AED Court of Inquiry" to focus attention on important problems affecting distributor-manufacturer relations. Both professional actors and Round Table members were in the cast. The "court" weighed points to be considered when preparing or accepting a manufacturer-distributor contract.

AED's 1957 convention will be held in Chicago next January, running concurrently with the opening three days of the 1957 Road Show, sponsored by the American Road Builders Assn.

Safety Awards Made

The National Constructors Assn. recently announced five safety awards to member companies. The Association is composed of leading engineering and building firms engaged in the engineering and construction of chemical plants, petroleum refineries, steel mills and power plants.

Companies which received the awards were The Chemical Construction Co., New York; The M. W. Kellogg Co., New York; Koppers Co., Inc., Pittsburgh, Pa.; Procon, Inc., Des Plaines, Ill.; and The Rust Engineering Co., Pittsburgh.

The award is given annually to companies which establish safety records based on frequency and severity of injuries lower than the Association average.

New Orleans Work Starts

The city of New Orleans, La., with the help of the McWilliams Dredging Co., has started to reclaim its soggy, marshy wastelands for use as manufacturing plant sites.

The $3 million project will convert 20,000 acres of swamp into dry, solid ground and will protect an additional 20,500 acres of adjoining land through the erection of 15 miles of levees.

The McWilliams Co. was awarded the contract by the Levee Commissioners of the Orleans Levee District. The project will be finished in approximately one year, according to Alfred A. Strelsin, chairman of the board of McWilliams.

The McWilliams contract is the first step toward draining and developing the large amount of wasteland in the New Orleans area.

McWilliam will build some 80,000 feet of new levees which will rise 12 feet above the existing marsh. The levees will cross 13 bayous and 11 small lakes. Over 16 million cubic yards of material will be handled.

Because of the physical composition of the floating marsh, four or five feet of decayed vegetation as well as an-

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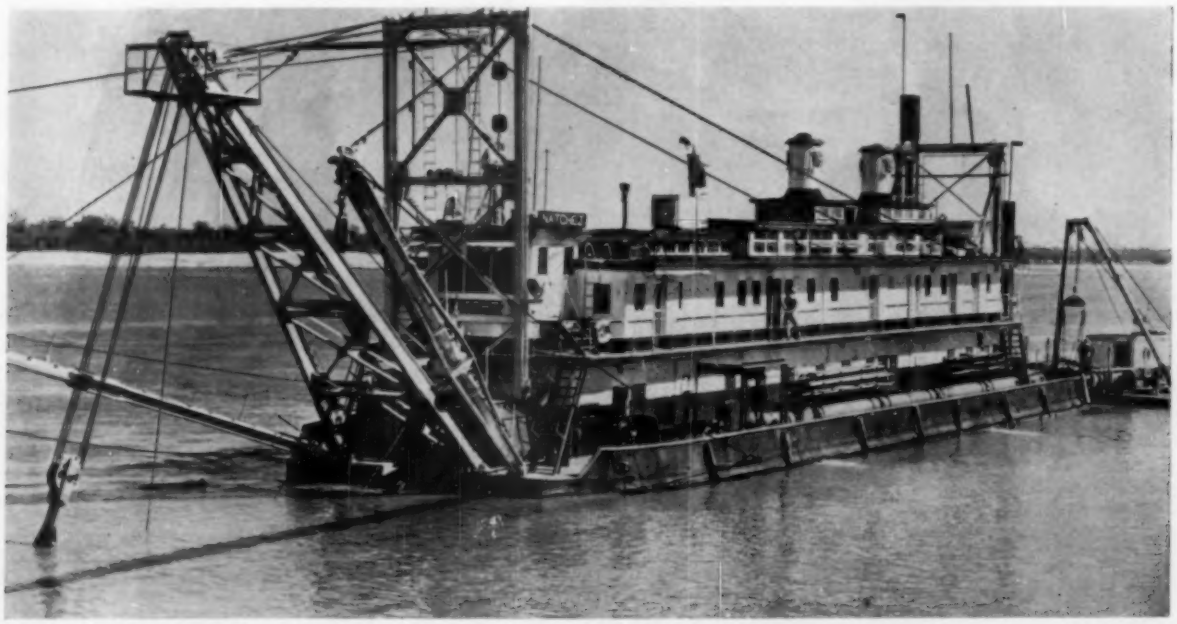


Marshy wastelands near New Orleans, La., are being converted into industrial sites by McWilliams' dredges such as the Natchez.

BOOST DIESEL OUTPUT

with less fuel...less noise...less smoke

AiResearch Turbochargers give your stationary or mobile diesels more added horsepower than any comparable turbocharger or supercharger installation!

The application of AiResearch Turbochargers to stationary diesel equipment will overcome excessive noise and smoke problems... jump horsepower to a much higher level... and cut your fuel bills on a horsepower per hour basis.

In addition, it will restore operating efficiency for your diesel power plants at altitude.

Application of these finely engineered power packages to mobile diesel equipment is equally effective... as has already been demonstrated in the remarkable results achieved by the installation of AiResearch Turbochargers on Caterpillar diesel machinery.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability. Your inquiries are invited.

THE GARRETT CORPORATION

AiResearch Industrial Division

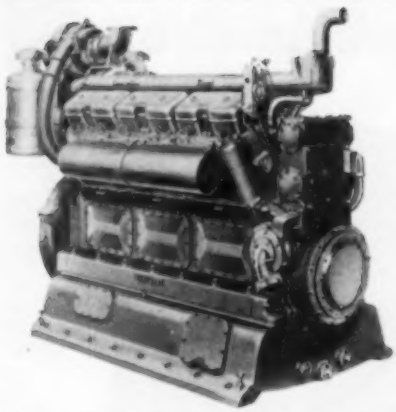
9225 Aviation Blvd., Los Angeles 45, California

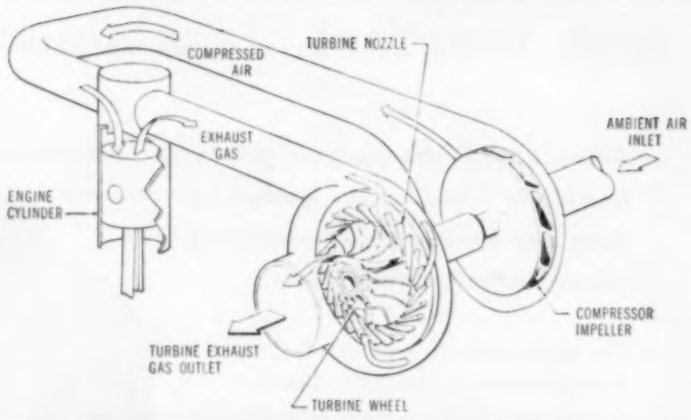
DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

Caterpillar announces a TURBOCHARGED

D397 (SERIES D) 650 HP Maximum @ 1300 RPM AND D375 (SERIES D) 430 HP Maximum @ 1300 RPM

Compact, modern heavy-duty diesels for greater power, efficiency and economy!





The Cat D397 Turbocharged Engine

Both the D397 and the D375 are also available as *roots blown, naturally aspirated* or *spark ignited* engines.

The Turbocharger . . . Exhaust Gas and Air Flow

Another example of Caterpillar leadership in action! The Turbocharger, driven by the engine exhaust, utilizes energy which would otherwise be lost. It packs air into the engine according to engine *load* for greater efficiency.

As shown in the diagram above, engine exhaust gases turn the turbine, which drives the compressor . . . the compressed air then enters the cylinders. Final result: more power on less fuel.

More than eighteen years of research have gone into these two new CAT* Turbocharged Diesels. Incorporating metallurgical, mechanical and aerodynamic advances, they are engineered to deliver higher horsepowers and lower operating costs at reduced noise levels. Their advance-design features are also available in D397 and D375 Electric Sets and Marine Engines.

With these engines in the Caterpillar line-up, you now have an even wider choice of compact, modern heavy-duty power to meet your requirements. Get the complete facts about these two new Turbocharged Diesels from your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

MODERN HEAVY-DUTY DIESELS

NOT in the Contract

A young couple with a yen for gambling spent its honeymoon at a resort near the race track. Bad luck hounded the pair for the first five days. This left them with $2 between them for the last day of the honeymoon.

"I'm going to the track alone today, honey," said the husband. "Wait for me at the hotel. I've got a hunch."

At the track, he picked a 40-to-1 shot on the first race. He won. A rank outsider won each succeeding race, and he had money on all the winners. He had won more than $10,000 when the races ended.

On the way back to the hotel, he decided to stretch his luck further and visited the gambling room of a club. Quickly he ran his winnings to $40,000. He was ready to leave when the wheel started to spin again. Suddenly he put the entire $40,000 on "black."

The ball bounded and settled. "Number 14," came the call. "Red."

The boy walked back to the hotel. His wife was waiting for him on the veranda.

"How did you make out?" she called eagerly.

The boy lit a cigarette. "I lost the $2," he said.

A seven-foot tall fellow was an applicant for the job of life-guard.

"Can you swim?" he was asked.

"No, but I can wade to beat hell."

Telegram from vacationing husband to wife: "Scenery is here, wish you were beautiful."

Teacher: "How many sexes are there?"

Little Boy: "Three."

Teacher: "Name them."

Little Boy: "The boy sex, the girl sex and the insects."

Where there's a will there's always a relative.

One day two men on a train were discussing whether they should go to Minneapolis or St. Paul.

"I don't want to go to Minneapolis," said one. "Too many Swedes."

"I guess St. Paul is out, too," observed the other. "Too many Swedes."

An elderly Swedish lady sitting behind them overheard their comments and spoke up: "Excuse me, gentlemen, but if you are looking for a place var there ain't no Swedes—vy don't you go to hell?"

Father: "Your young man approached me and asked for your hand in marriage. I consented."

Daughter: "But, father, I don't want to leave mother."

Father: "I quite understand, child. But don't let me stand in the way of your happiness. Take your mother with you."

"I paid a hundred dollars for that dog —part bull!"

"What part is bull?"

"The part about the hundred dollars."

Two dowagers met in Paris by accident and impressing each other with their knowledge of French, liberally sprinkled French words thoughout their sentences. In the course of the conversation one remarked to the other, "You know, my dear, I've been here a week and I haven't been to Louvre yet."

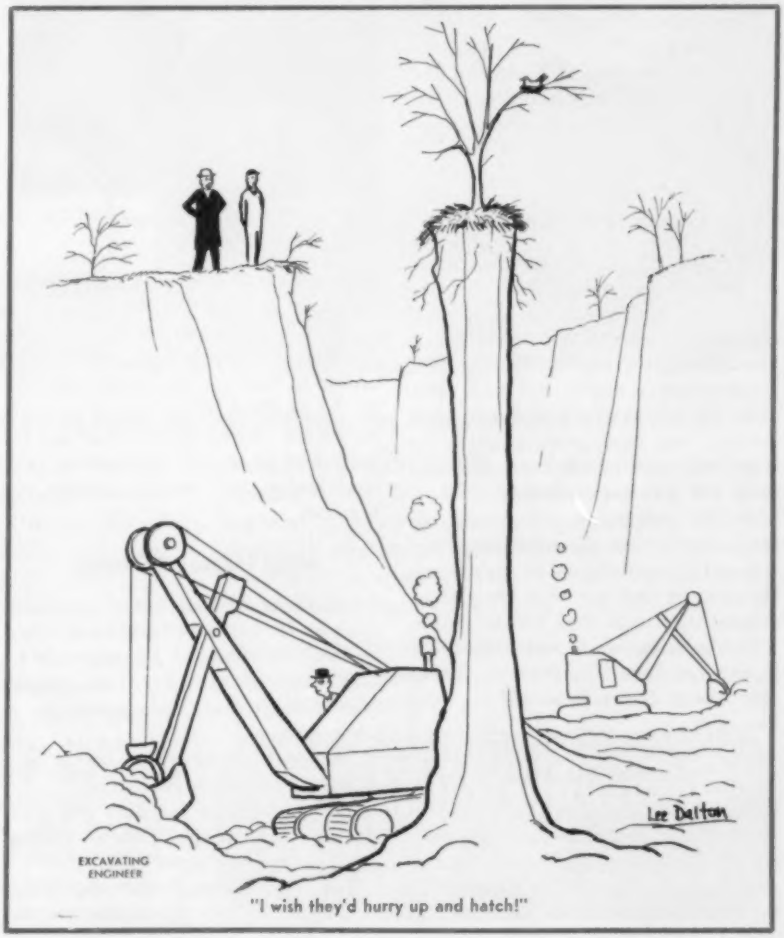
"I wouldn't worry, Melba," replied the other, "it may just be the change in water."

Then there was the man who gave up drinking for the sake of his wife and kidneys.

One of the nicest features of old age is that you can whistle while you brush your teeth.

If you think it over you'll have to agree that Adam was really the first engineer. Didn't he furnish the parts for the first loudspeaker?

"I guess I've lost another pupil," said the professor as his glass eye rolled down the sink.



"I wish they'd hurry up and hatch!"

Continued from page 52

other lower layer from 5 to 10 ft. thick composed of silt with decayed roots, stumps, humus and other foreign matter must be stripped or removed to provide a stable foundation.

Large dredges will claw out a ditch about 55 ft. wide and 10 to 15 ft. long along the centerline of the levee. The decayed matter will be deposited evenly along each side of the centerline ditch to form smaller retaining walls for the "hydraulic fill" which will make up the actual levee.

McWilliams engineers plan to use hydraulic levee fill pumped out of borrow pits that may go as deep as 40 feet. More than 14 million cubic yards of fill will have to be excavated to get the necessary 4,660,000 yards for the levee embankments. Once pumped, the fill remains in a state of suspension in the water and escapes through the drainage gaps in the levee. The levee embankment will be dressed by small draglines and bulldozers before seeding.

The section of land to be made available by the project is bordered by 25,000 feet of the Intercoastal Waterway and will be near the proposed deep water channel for New Orleans. The area also is served by U. S. Route 90 and two railroads.

English Exhibition Set

More than 250 exhibitors are expected to occupy more than 400,000 square feet of floor space at the Mechanical Handling Exhibition & Convention in London's Earls Court May 9-19.

Labor aids on display will range from aerial ropeways and lift trucks to earth moving and mining machinery. The larger and more mobile types of equipment will give demonstrations.

At the convention, which will run concurrently with the exhibition, overseas speakers will discuss in open forum the methods used in a wide range of industries. Industrial films will be shown.

Further information and tickets may be obtained from The Exhibition Manager, Dorset House, Stamford St., London, S. E. 1.

Cement Use Rises

Consumption of Portland cement in 1956 will require a record plant output of more than 290 million barrels, according to a study completed by the building materials and construction division of the Business and Defense Services Administration, United States Department of Commerce.

Anticipated domestic consumption for 1956 is 290 million barrels, an increase of about 2% over the 1955 consumption of 284 million barrels.

Vermont Names Poeter

William Poeter of Goshen, Vt., was appointed by the Vermont Highway Board to succeed Paul H. Gates as state highway commissioner.

The appointment, effective April 1, was approved by Gov. Joseph B. Johnson.

Gates, highway commissioner since 1951, resigned to resume active management of his telephone and electric power companies at Franklin, Vt.

William Poeter

Poeter had considerable management and construction experience with P. Ballantine & Sons of New Jersey and the M. W. Kellogg Construction Co. of New York. Poeter came to Vermont in 1953 and organized a plumbing, air conditioning and heating concern at Brandon.

AIME Honors Buchman

Louis Buchman, Salt Lake City, Utah, received the American Institute of Mining and Metallurgical Engineers' William Lawrence Saunders Gold Medal "for distinguished achievement as a mining engineer."

The presentation was made at the AIME convention in February.

Buchman is vice president and general manager of the Western Mining Div., Kennecott Copper Corp.

The citation stated that the award was especially for his work "in the development of open-pit methods for mining copper ores, particularly in the fields of mechanization, electrification and standardization."

Born in Latvia and graduated from Michigan College of Mines with the degrees of B.S. and Engineers of Mines, Buchman later received the honorary degree of Doctor of Engineering from Michigan College of Mining and Technology. Following an early career in Nevada, Utah, Arizona and Oregon, Mr. Buchman joined Utah Copper Co., becoming vice president and director of its successor, Kennecott Copper Corp., in 1952. He supervised the Western Mining Div. until he retired in 1953 after 39 years with Utah and Kennecott. He is consultant to Kennecott at present.

Carl E. Reistle, Jr., of Houston, Texas, vice president and a director of Humble Oil and Refining Co., was installed as president of AIME. He succeeds H. DeWitt Smith, New York.

Reistle has achieved wide distinction in the petroleum field. He is the author of many technical papers on oil brines, paraffin problems in crude oil production and operation of flowing wells.

Born in Denver and graduated from the University of Oklahoma, Mr. Reistle joined the Bureau of Mines in Bartlesville, Okla. Chairman of the East Texas Engineering Assn., he had an important part in establishing production rates and practices. He joined Humble Oil and Refining Co. in 1936 as engineer in charge of the petroleum engineering division. He was elected to the board in 1948 and became vice president in 1955.

Transportation Congress

The sixth Highway Transportation Congress will be held at the Mayflower Hotel, Washington, D. C., May 8-10.

A testimonial luncheon will be held May 9 for Albert Bradley, executive vice president of General Motors Corp. and chairman of the National Highway Users Conference. Bradley also will deliver the keynote address.

Herschel D. Newsom, vice chairman of the NHUC, will deliver an address on rural roads. The present day highway situation will be the subject of an address by W. A. Bugge, director of the Washington (state) Department of Highways.

Panels will discuss "Traffic, Freedom and Good Business with Controlled-Access," "State Conference Support to Official Action for Safety" and "The Highway User Wants to Know . . ."

4500 Dragline tackles largest muck hole

Excavating the biggest muck hole on the Indiana Turnpike looked like a real construction "nut cracker" until A. L. Dougherty Co. of Indianapolis came on the scene with their powerful Manitowoc Model 4500 dragline. Equipped with a 140′ boom and 5-yd. perforated bucket, the long reach, big capacity 4500 soon had spoil banks piled high with the wet, sticky material. The muck excavation was about 170′ wide and 3000′ long. Approximately 50′ to 60′ of material was removed and replaced with a surcharge of sand. In the picture above a depth of 54′ had been reached without hitting bottom.

You need outstanding Dragline performance for tough jobs like this

• **POSITIVE STABILITY** assures full capacity buckets with any length boom. You get more heaped loads from one position, cutting down on the number of machine moves. Long, wide crawlers with low ground pressure let you work in soft, hard-to-reach spots and travel over soft ground without mats.

• **MORE POWER** through simple, clean design. There's less dead weight — less maintenance . . . more power for top performance every shift. Fewer parts provide more effective utilization of power. Fuel consumption is lowered for most economical operation possible with a machine of this size. Single diesel power plant eliminates need for several electric motors and thousands of electric wires and connections . . . greater mobility without dangerous, awkward cables dragging from machine.

• **FAST CONVERTIBILITY** to shovel and crane operation makes the 4500 a versatile unit for any type of construction job. Big capacity, 5½-yd. shovel is engineered for your roughest jobs. 100 ton crane is ideal for heavy construction work. Manitowoc Engineering Corp., Manitowoc, Wis.

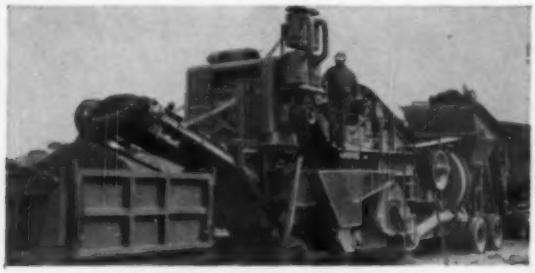
Your MANITOWOC distributor has all the facts on the Powerful 4500 . . . contact him now!

MANITOWOC
SHOVELS 1-5½ YD. Speed Crane CRANES 20-100 TON

For Lower Costs on
SPECIFY GM
In ALL Your

PRODUCTION DOUBLED—FUEL COSTS CUT 33⅓%

When Clark & Sons Sand & Gravel Company switched to a GM 2-cycle Detroit Diesel properly engineered for this dredge, production jumped more than 200% and fuel costs dropped one third. GM Detroit Diesel weighs half as much as engine it replaced, starts easier, too.



FUEL COSTS $1.18 PER HOUR

And that's "mighty cheap" for a 300-H.P. engine according to Charles Bartelma, Superintendent of Minnesota's Kimmes Construction Company. This GM Detroit Diesel-powered Cedarapids crusher produces 4,200 tons of gravel a day—engine has had no repairs in 2½ years.

PRODUCTION UP 30%—FUEL COSTS CUT 40%

When Calumet Paving Company switched to a GM Detroit Diesel on this paver they got an engine that "starts easier, performs better, costs less for fuel and maintenance." Company also operates two other pavers and three crawlers—all GM Detroit Diesel-powered.

15 YEARS' SERVICE AND STILL GOING STRONG

The GM Detroit Diesel in this Koehring shovel went to work for Paul Frank, Inc., in 1941—is still giving "economical, trouble-free service." Owner calls engine an "excellent investment, considering low first cost, operating economy and long life between overhauls."

OPERATES 20 GM DETROIT DIESELS

Ohio road-builder A. J. Baltes, Inc., operates 20 GM Detroit Diesel engines powering shovels, cranes, draglines and other equipment. Company specifies GM Detroit Diesel power when ordering new equipment—also replaces other engines with GM Detroit Diesels to get "the fundamentals needed for economical operation—performance, economy and service availability."

Every Contract

DETROIT DIESEL POWER

Construction Equipment

YOU CAN HANDLE every construction job from first cut to final paving—and handle it at less cost—with General Motors Detroit Diesel-powered equipment.

Shovels, scrapers, compressors, graders—machinery for over 1,000 applications made by more than 150 manufacturers—are powered with GM Detroit Diesel engines, *America's first choice Diesel.*

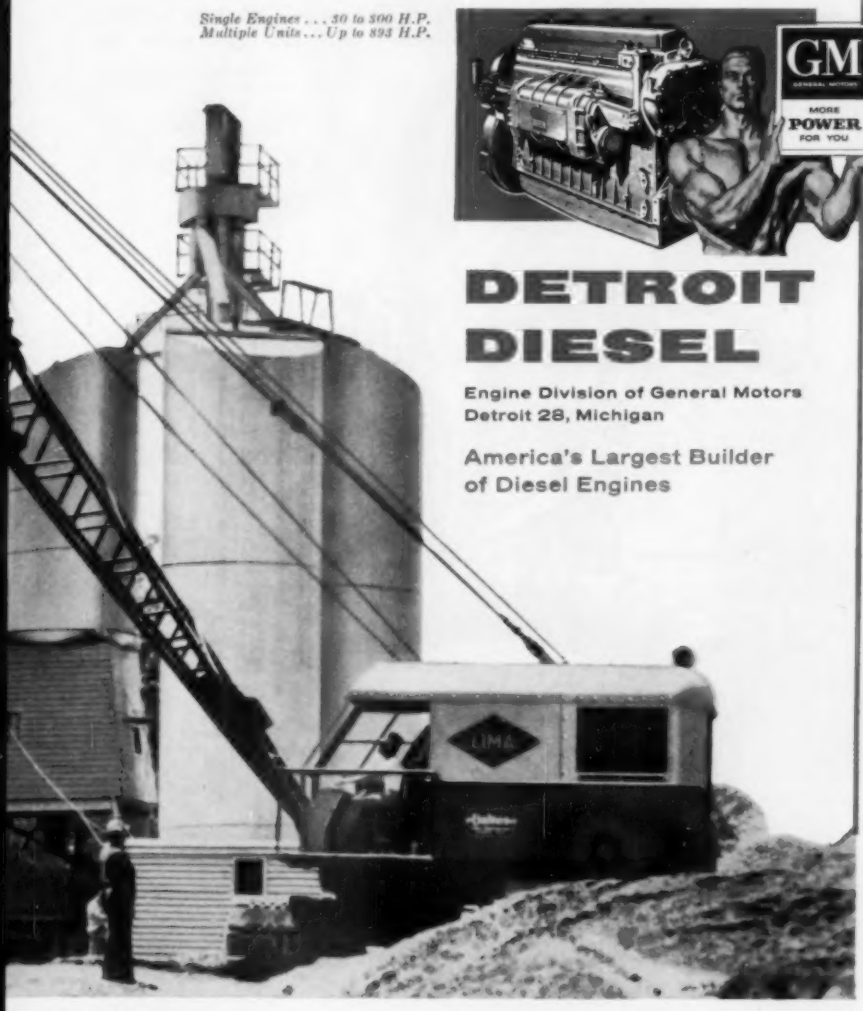
This compact, brawny work horse costs less to buy than other Diesels of comparable horsepower.

It costs less to run because its snappy 2-cycle operation gives faster acceleration, faster digging and hauling, more work done per shift.

And it costs less to maintain, too. Parts cost less. Valves, cylinder liners cost less than similar parts for other Diesels.

For full details on GM Detroit Diesels—and the equipment they power—call in your local GM Detroit Diesel distributor or write direct.

Single Engines . . . 30 to 500 H.P.
Multiple Units . . . Up to 893 H.P.



DETROIT DIESEL

Engine Division of General Motors
Detroit 28, Michigan

America's Largest Builder of Diesel Engines

Parts and Service

When and Where You Need 'em

Back of GM Detroit Diesel performance stands a national network of 165 GM Detroit Diesel distributors and dealers.

They're ready to supply you with factory-engineered parts *where* and *when* you need them.

They're ready to send factory-trained servicemen speeding to your job day or night—men with all the skill and know-how it takes to keep your GM Detroit Diesels running right.

And they're ready to fill your every power need whatever it is—from a complete new engine to a minor replacement part.

When you get replacement parts from your GM Detroit Diesel distributor or dealer you're getting *factory-engineered* parts built to the same high quality standards—by the same precision methods—as the parts used in building GM Detroit Diesel engines.

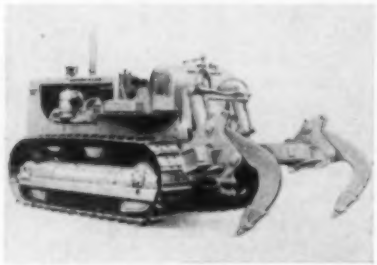
You get parts with every improvement advanced engineering has developed because *only* GM Detroit Diesel parts have *all* the improvements originated by GM engineers at Detroit Diesel.

And you get longer-wearing parts that have been proved in billions of hours of service on the toughest jobs.

For full details on the parts and service behind GM Detroit Diesel performance, call in your local GM Detroit Diesel distributor or dealer. He's listed in the Yellow Pages—or write direct for the name of the distributor nearest you.

Equipment You Ought to Know About

Tractor-Mounted Ripper



Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: A new tractor-mounted heavy ripper for use with the D8 tractor is now offered by Caterpillar. The tractor-mounted unit is designed to facilitate better maneuverability and ease of operation over the tractor-towed type. Down pressure equivalent to the weight of the rear end of the tractor is now available to the operator.

The new No. 8 ripper is operated by means of a hydraulic control and two double-acting hydraulic cylinders. The hydraulic pump is mounted on and driven by the engine rear power take-off so that the ripper can be raised or lowered whenever the engine is running, independent of the flywheel clutch. The control valve is enclosed in the tank and provides the operator with raise, lower, hold and float positions. The tank is mounted separately on the rear of the tractor.

The ripper is mounted on special brackets which replace the standard drawbar brackets. The standard drawbar clevis is retained and may be used by swinging and pinning the ripper teeth up out of the way. The ripper's two shanks are mounted on an alloy steel, box-section beam, and each is pinned to a clevis which provides a pivot mounting and allows the tooth to swivel 10° to either side. The shanks are made of a special high alloy steel and are heat-treated to resist abrasion and high shock loads. The teeth points are replaceable.

Twin Disc Torque Converter

Manufacturer: Twin Disc Clutch Co., Racine, Wis.

Claims: A new three-stage 13,800 series torque converter has been designed specifically to accommodate a large number of engines for which previous Twin Disc models were not ideally suited. The new series may be used with many engine models, including the following: Allis-Chalmers PC1879, DC1879, DSC-1879, PCS-1879, PC-2505; Caterpillar D-342, D8, D-364, D9, D-375, D-386; Cummins LRI, NVHS, VT-12; Murphy 24, 122, 322 and Waukesha NKD, NKR, NKDS, LRD.

The new series is planned around a simple basic unit with easy-to-add components which produce 10 specific models. This arrangement permits extreme flexibility and speedy interchange of components to provide a model specifically adapted to a wide variety of applications.

The 13,800 series provides two output arrangements. There is one standard output shaft assembly designed for maximum side pull loads up to the full capacity of the converter. On this particular type output shaft assembly an output governor take-off is available. There is also one standard output flange designed for universal joint or flexible gear coupling drive.

The series is designed to fit new Society of Automotive Engineers standard flywheels recently developed, and accommodates both Nos. 0 and 00 housing sizes.

¾-hp Electric Motor

Manufacturer: General Electric Co., Schenectady 5, N. Y.

Claims: A new ¾-hp, 3,450-rpm double shaft utility motor, weighing 21 pounds and designed especially for home workshop and farm applications, has

Continued on page 62

Champions in their field...

All horses can run—all shovels can dig. But it takes a champion to win consistently—especially when the going gets tough. The rewards of championship performance are great. For economically sound pride of ownership and consistent output that earns and deserves continued enthusiasm, try a Marion. It's a champion in its field!

Marion 111-M—Up to 5 Yard Dragline

Marion Means Business

MARION POWER SHOVEL COMPANY — MARION, OHIO

New Equipment . . .

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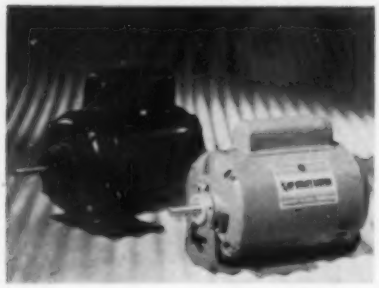


been announced by General Electric's general purpose component motor department.

The heavy-duty motor is suitable for use on bench saws, jointers, band saws, shapers, planers and grinders. It is also recommended for application on disc finishers, pumps, concrete mixers, compressors and water systems where 3,450-rpm speed can be used.

The double shaft motor, designed for operation on 115 volts, is of the capacitor type for hard-to-start loads, giving 2½ times full-load power for starting. It will carry momentary running loads up to 2 hp.

All-angle, sleeve-type bearings on the new motor permit operation in any position, and a sealed-in lubrication system helps prevent oil loss. Of two-pole design, the new motor is 30% lighter than most four-pole designs, resulting in easier and more economical mounting.

Telescopic Body Hoists

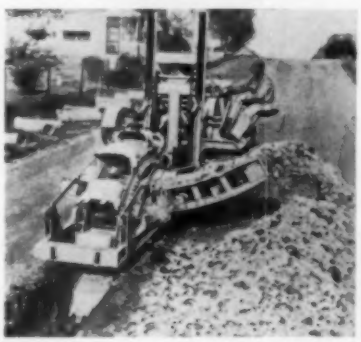
Manufacturer: Galion Allsteel Body Co., Galion, Ohio.

Claims: A new Galion line of front mounted single telescopic hoists for use with 8 to 15-ft. bodies allows a substantial payload increase without violation of highway weight laws. Known as the Uni-scopic series, the new hoists are said to have greater lifting capacity, yet weigh less than underbody hoists. With Uni-scopics, most hoist weight is moved to the front axle and, because the new hoists lift at the front of the body, bigger payloads can be shifted forward to load the front axle to its legal limit, the manufacturer states. Integrated design of Uni-scopic hoists and matching bodies is said to improve dumping stability.

Payload capacities range from 3 to 14 yards and 9 to 20 tons. Hoist cylinders are three stage with 5 or 6-in. first stage sleeves, depending on hoist capacity. Hoist size is based on first effective sleeve diameter, not on base cylinder diameter.

Fast dumping action is provided by a high capacity roller bearing pump, designed to meet the large oil volume requirements of telescopic hoists. A three-position spool-type control valve is built into the pump.

Wheel-Type Trenchliner



Manufacturer: Parsons Co. (Koehring Co. subsidiary), Newton, Iowa.

Claims: A sensitive hydraulic digging wheel control system has been developed for the Model 150 Trenchliner by Parsons. The digging wheel moves up and down a vertical mast. A wheel-hoist ram raises and lowers the wheel to hold close grade tolerances at any digging depth. A separate mast-tilt ram holds the mast in a vertical position and tilts it to bring the weight of the wheel forward for proper balance and clearance when traveling or loading on truck or trailer.

Digging speeds of the Model 150 Trenchliner range from 12 inches to 25 lineal feet of trench per minute. It is equipped with a wide selection of 30 digging feeds to assure peak trench production in any soil condition. Maximum digging depth is listed at 5 feet 9 inches with six digging wheel cutting widths from 16 to 26 inches.

Designed for handling of trenching assignments in drainage work, pipeline installations, irrigation projects and general utility and construction work, the 150 Trenchliner can be powered either by standard 60-hp gasoline or diesel engine. Crawlers are long and wide for low ground bearing pressure. Grouser crawler shoes assure positive traction. A choice of three bucket styles is available to fit digging conditions.

Worthington Compressor

Manufacturer: Worthington Corp., Harrison, N. J.

Claims: Worthington has added a new 210-cfm portable rotary compressor, making available a complete line of modernized Blue Brute compressors which include the 125, 210, 315 and 600-cfm sizes.

The 210-cfm compressor incorporates the same basic features and engineering advancements as the company's other units. Among them are a newly-designed clutch and separate oil reservoir equipped with a pre-heater.

General maintenance and inspection of parts have been simplified by easy accessibility features. A gravity-draining design of the cylinders prevents "lock" and the danger of oil accumulation.

All types of standard mountings are available in all the Blue Brute sizes.

Electrically-Powered Truck

Manufacturer: Kenworth Motor Truck Co., Seattle, Wash.

Claims: An electrically-powered earthmover truck for underground hauling is now available from Kenworth. The new 802-E unit is the first electrified earthmoving truck to be designed and manufactured in the United States, Kenworth says. Powered by electric traction motors, the truck receives current

Continued on page 64

new, improved

PAYLOADER®

tractor-shovel

model HO

2¼ cu. yd. CAPACITY

7,500 lbs. @ 4 mph

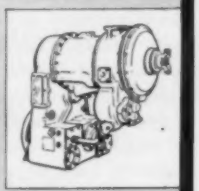
Bigger Capacity–Better Performance

This new 1956 model HO has a bucket capacity of 2¼ cu. yd. payload, 1¾ cu. yd. struck . . . is the biggest capacity "PAYLOADER" ever offered, and outstanding by any measure. Pound for pound, it's way ahead of the field in digging power and carrying capacity. The famed Hough bucket motion has powerful pryout action and 40° tip-back at ground level to *get* big loads and *hold* big loads without spilling.

It has power brakes, power steer and power shift . . . is more maneuverable . . . faster and easier operating and easier riding — with or without a load. It delivers better, more reliable traction over a wider range of ground conditions than any wheeled tractor-shovel *ever* has. It has balanced design and durability *throughout* to deliver big yardage day after day without interruption.

If you want the last word in a big husky tractor-shovel, insist on a model HO. Your "PAYLOADER" Distributor has all the facts.

Complete Power-Shift Transmission



The fastest and easiest-operating transmission ever built. All shifts can be made instantly, on-the-go, under full engine speed. There's no stopping for a RANGE shift, there's no foot clutch. With the forward-reverse control the operator can "creep" the machine at full engine speed, in any gear, while maintaining full bucket action . . . all this plus torque converter drive.

Planetary Final Drives

Rugged planetary final drives in the wheel hubs, plus hypoid differential gearing, keep torque low in axles . . . prolong life of axles and all drive train parts. Torque-proportioning differentials assure effective traction under slipping conditions. If one wheel starts to slip more power is delivered to the opposite wheel.

PAYLOADER®

MANUFACTURED BY

THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.

708 Sunnyside Ave., Libertyville, Ill.

Send full information on "PAYLOADER" 4-wheel-drive tractor-shovels.

☐ model HO—2¼ cu. yd. ☐ model HH—1½ cu. yd.

☐ model HU—1 cu. yd.

NAME _____

TITLE _____

COMPANY _____

STREET _____

CITY _____

STATE _____

New Equipment . . .

Continued from page 62

from overhead wires through a trolley. The truck also is equipped with a cable reel so that the operator can maneuver away from the overhead wire zone.

Capacity of the earthmoving truck is 16 yards struck, or 24 tons. The heaped load capacity is 19 yards. Gross vehicle weight rating is 93,000 pounds. It has a fabricated steel frame with variable vertical sections and tubular cross members. The front axle capacity is 25,000 pounds and is a double reduction type. First reduction is a spiral bevel drive unit. Final reduction is through planetary gears in each wheel. Power steering, two-step dynamic braking and rubber-mounted springs are other features.

The dump body is of all-welded steel construction. Braces are box-section ribs with longitudinal reinforcing between the ribs at the body sides. The body flares from front to rear. A three-stage telescopic hoist is straddle-mounted.

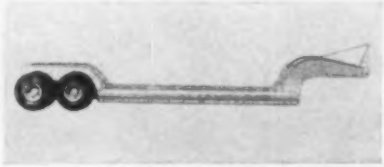
The 802-E wheelbase is 14 feet. The overall length is 24 feet 10 inches, with an overall width of 11 feet 6 inches and an overall height of 11 feet 10 inches. The one-man offset cab is enclosed and has access doors on both sides.

The trolley poles of the Kenworth 802-E are located on a special structure which is erected on the top of the front bumper to the right. The main traction motor, a 550-volt General Electric unit, is located where the transmission would be positioned in a diesel-powered truck. An auxiliary 550-volt motor is located under the hood to power air compressor, power steering, hoist pump and the lighting system. For ease of maintenance, electrical controls are centralized in a box to the driver's right.

For use in operating the 802-E away from the trolley zone, a cable reel, driven by two 550-volt electric motors, is mounted under the hood and between the front wheels.

Maximum speed, when empty on a level road, is 25 mph. Maximum laden speed on a level road is 18 mph. Maximum laden speed on a 10% adverse grade is 10 mph. Regenerative braking is used on return hauls of the unladen truck. It is designed with two downhill speed controls, at either 7 or 14 mph.

Talbert Trailer



Manufacturer: Talbert Construction Equipment Co., 7950 W. 47th St., Lyons, Ill.

Claims: A new 100-ton capacity Model TDW-100-RG low-bed trailer has been developed by Talbert. It is said to provide safe, easy, over-the-front-end or over-the-rear-end loading of heavy equipment and machinery by means of a removable gooseneck and the removable rear axle assembly. Construction of the rear axle assembly features full width solid bar axles and cast steel walking beams. Standard specifications call for a deck length of 24 feet. Additional deck length is available on special order. The deck is designed with drop-side construction, which provides a minimum deck height. The addition of a simple wedge device permits road clearance to be raised or lowered, depending upon operating conditions. Overall length is 45 feet 7¾ inches and overall width is 11 feet. Tire size is 16.00 x 25-20 ply.

Buckeye Ditcher

Manufacturer: Gar Wood Industries, Inc., Wayne, Mich.

Claims: The new Buckeye Model 330 is described by Gar Wood as the world's largest ditching machine. The giant excavator is capable of moving 600 yards of dirt per hour. It cuts a trench 11 ft. 3 in. deep and 5 ft. 4 in. wide.

The new ditcher is designed for heavy-duty pipeline construction and deep sewer work. It also can be adapted for open-ditch type irrigation work, digging a trapazoidal ditch with a top width of 19 feet, a depth of 8 feet and a bottom width of 3½ feet.

The Buckeye 330 incorporates design features never before used in ditching machines, according to Gar Wood. A hydraulic power steering arrangement provides the operator steering control for the 55-ton giant. It is equipped with a combination of 30-in. tracks in the rear and 30-in. pneumatic tires in front.

Power from a Caterpillar diesel engine rated at 220 operating hp flows through a torque converter to two Allison torquematic transmissions. The transmissions provide the speed ratios for the traction drive and a choice of 15 speeds for the digging wheel drive. This arrangement permits shifting to be done at all speeds, regardless of torque capacities. Speed is controlled by lever type selectors which are operated without stopping the forward drive of the machine or the digging wheel. The travel

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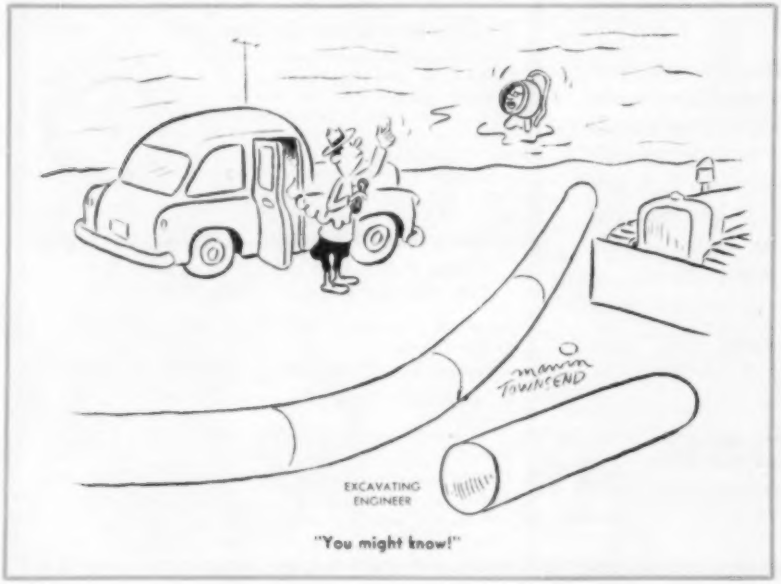


"You might know!"

OWNER AND OPERATOR AGREE:

Allis-Chalmers HD-16C torque converter tractor works longer, works faster, produces more

Dozing and pulling a scraper in rock-like shale, the HD-16C owned by Murray Construction Co., Waverly, Ohio, is relocating route 73, northwest of Peebles. On one stretch of road, fill being hauled 1200 ft by the 150-hp crawler and a 15-yd scraper will raise highway grade where it crosses a valley.

More Yardage per Dollar

Co-owner Robert Murray has this to say about the new HD-16. "The tractor is a speedy worker and the torque converter is one of the reasons. We also find we haul more yardage for each dollar spent. And the time saved in not greasing track rollers daily should increase our profits."

Operator Kenneth Austin added this: "Our former tractor would stall loading rock like this, but the '16' goes right through. The torque converter saves clutching and makes it a lot easier for me. At the end of a day's work I'm not nearly as tired.

Saves Half Hour Greasing Time Daily

"I get more production because I put in an extra half hour a day hauling and dozing instead of greasing track rollers. I can haul and dump three 15-yd loads in that time and that amounts to 225 yd of extra pay load every week."

★ ★ ★

An HD-16 gives you more power for bigger jobs . . . plus more effective use of power, with a brand new Allis-Chalmers diesel engine and your choice of two great drives — the job-proved torque converter or the easy-shift standard transmission. But that's not all — you get many more advanced basic design features such as all-steel, box-A main frame and one-piece steering clutch and final drive case . . . unit construction . . . and timesaving, simplified lubrication and service designed with better maintenance in mind.

All in all, an Allis-Chalmers HD-16 brings you a top combination of performance and long life with mounted or drawn equipment . . . a higher rate of production, more working time, lower job costs.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Talk to your Construction Machinery Dealer today

ALLIS-CHALMERS

New Equipment . . .

Continued from page 64

mechanism can be stopped while the digging wheel continues to operate and clean out the buckets.

The 330's 17-ft. 6-in. diameter digging wheel is lowered or raised by two individual hydraulic hoist units. Each has separate controls to allow independent or simultaneous operation. Either the front or rear of the digging wheel can be raised or lowered. The dirt conveyor is hydraulically driven at variable speeds and operates independently of any other function. Another independent hydraulic unit controls the elevation of the conveyor.

Improved Payscrapers

Manufacturer: International Harvester Co., Chicago 1, Ill.

Claims: Two models in the International Harvester line of self-propelled, rubber-tired Payscrapers have been improved recently. They are the 262-hp Model 75, whose capacity has been increased to 20 yards heaped, and the 172-hp Model 55, whose capacity has been increased to 14 yards heaped.

Other changes in the improved units include straight-back bowl, lower draft

frame, a new cerametallic clutch facing, higher apron lift, bigger push block and improved injector.

The back of the Payscraper bowl has been redesigned similar to a dozer blade. The dirt boils back into the bowl from the cutting edge, fills the corners and heaps a full load.

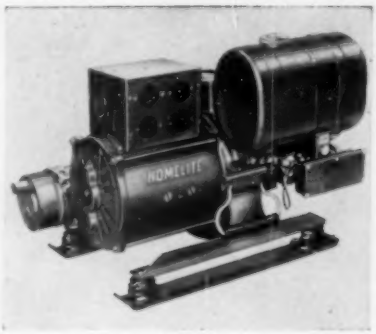
A new cerametallic clutch offered on the Model 75 is made of a combination of powdered metals and ceramic materials similar to those used in jet airplane brakes. The new clutch provides more positive clutch engagement and reduces slippage, the manufacturer reports. Adjustment is less frequent. Clutch life has been lengthened considerably.

The apron lift is now higher than in the previous models to permit fast ejection of material. Arms are outside the bowl, away from the dirt, and allow the apron to close quickly and positively.

A wider and bigger push block permits the operator to make positive contact with minimum effort. The push block is properly placed to direct pusher thrust most efficiently. The wider block also helps to protect tires and the rear of the scraper.

Visibility also has been improved. The lower draft frame gives the operator improved vision of both the bowl and the push tractor.

1,500-Watt Generator



Manufacturer: Homelite Div., Textron American, Inc., Port Chester, N. Y.

Claims: A small size, light weight 1,500-watt generator has been announced by Homelite. The new 35A115 model is a 115-volt, 60-cycle AC generator, developed for use by contractors, builders, utilities and municipal departments. It will operate all types of portable electric tools and provide standby power in emergencies.

Easily carried by one man, the 35A-115 weighs only 90 pounds. It is equipped with four conveniently located outlets and can operate several tools simultaneously.

Close voltage regulation is a feature of the generator. It eliminates complicated DC winding and commutator and DC brush rigging by using a simple germanium bridge rectifier for excitation. The generator is compound wound to maintain a constant voltage output as load is applied. This combination of static excitation and static control limits the voltage change to 4% from no load to full load.

Wagon Drills

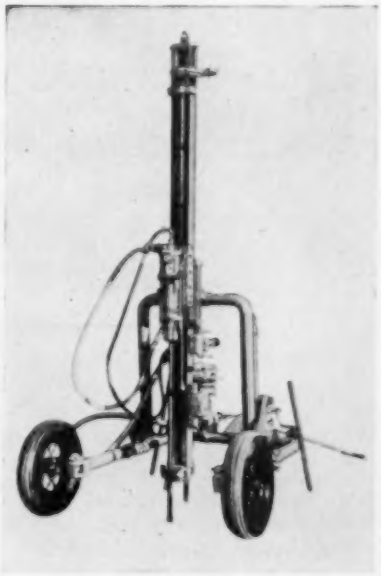
Manufacturer: Thor Power Tool Co., Aurora, Ill.

Claims: Two new air-driven wagon drills, featuring fully automatic controls grouped on a motor which can be re-positioned along the mast, have been announced by Thor. They are the SW-1, a general purpose model, and the BW-2, a heavy duty unit.

The SW-1 "baby" wagon drill is equipped with a saddle and cone, permitting mast adjustment for drilling holes through a full 360° in all directions. The chassis collapses by means of a worm drive, for drilling at various levels down to extremely low positions for snake or lifter holes.

The BW-2 heavy-duty wagon drill has been extensively redesigned and improved to replace the BW-1 unit which Thor introduced in 1948. Built around the company's Model 105 Drifter, the new rig incorporates a newly-designed mast with improved chain tension adjustments and shock absorbers to harness effectively the power output of the 4-in. bore drifter. The new design is especially effective when the drifter is under rapid traverse to the mast top for a new drilling cycle.

The BW-2 can be used with Thor's Model 82 or 92 drifters as well as with the 105 drifter unit. With any of these drifters, the mast alone is being made



available as a separate unit for operation on a "quarry bar," or in tandem mounting for pipe line drilling.

The new mast has grouped and movable controls, including lever-operated blower control and a motor feed control with infinitely variable feed ranging from two inches per minute to full

Continued on page 68

Let's look at why

Quarries Use More Bucyrus-Erie Excavators Than Any Other!

Big Output is the first important characteristic that quarry owners like about Bucyrus-Erie shovels. Balanced design and fast, sure control help operators achieve high-speed work cycles. The modern front end has plenty of strength to withstand tough digging stresses, yet deadweight is avoided so that more power works swinging payloads.

Dependability is a "must" for profitable quarry operation and Bucyrus-Erie Individual Design helps assure the desired reliability. Every part is matched to the rated capacity of the machine and there is correct balance between power, weight and speed for efficient digging.

Low Maintenance is important, too. Bucyrus-Eries have few wearing parts, no complicated "gadget mechanisms" to cause trouble. A positive lubrication system and the liberal use of anti-friction bearings smooths the flow of power to work, with minimum wear on moving parts.

Follow the lead of other quarries and let Bucyrus-Erie shovels work for you. Your Bucyrus-Erie distributor will be glad to furnish complete information on shovels from ⅜- to 4-cu. yd. capacity. For information on heavy-duty, electric quarry machines with capacities from 2½- to 8-cu. yds., write direct.

176E55C

BUCYRUS ERIE

South Milwaukee
Wisconsin

75 YEARS OF SERVICE to Men Who Shape the Earth

New Equipment . . .

Continued from page 66

speed for fast return or approach. The chassis has a re-designed hand crank for raising or lowering the mast and a positive 90° wheel lock for line drilling.

Universal Formpacker

Manufacturer: Western Form and Iron Co., Minneapolis, Minn.

Claims: The Universal Formpacker is a unit designed to quickly and efficiently compact the soil beneath concrete paving forms. It compacts soil under both sides of a form at the same time at the rate of approximately 25 fpm, and insures perfect alignment to withstand heavy weights of modern subgrading and finishing equipment. It is completely adjustable and can be set in a few minutes to fit all standard paving forms from 8 x 8 inches to 12 x 12 inches. Western says that it does a superior job over hand tamping operations.

The unit is available in both left and right hand models, permitting contractors to operate a machine on each side of the road simultaneously.

It weighs 330 pounds overall and is

guided by a handlebar which can be adjusted to height. The tamping mechanism operates from a counter shaft driven by a traction shaft connected to a Kohler K90R engine.

This engine develops 3.6 hp at 3,600 rpm, and is equipped with a 6 to 1 reduction gear. In addition to driving the tamping mechanism, the engine supplies the driving power to move the unit.

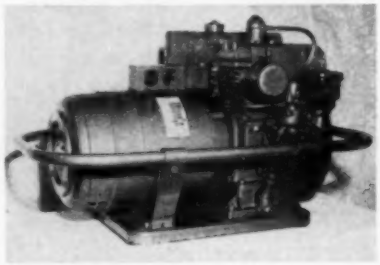
Katolight Power Plants

Manufacturer: Katolight Corp., Box 891, Mankato, Minn.

Claims: Katolight announces the availability of a new series of lightweight portable AC power plants.

Four models are available in sizes of 1000, 1500, 2500 and 3500 watts. Weights range from approximately 90 pounds on the 1000-watt model to less than 280 pounds on the 3500-watt model. Units are equally adaptable for emergency or to operate power tools for maintenance or construction.

The generator incorporates a new design that nearly eliminates commutator and brush problems. Briggs & Stratton four-cycle engines are also used. All units are equipped with protective car-



rying handles and convenient outlet receptacles. The units also are available with two wheel dollies.

The 2500 and 3500-watt units are dual 110/220 volts as standard, making them adaptable to all standard single phase uses. This series is available with manual start only.

Diaphragm Pump

Manufacturer: Homelite Div., Textron American, Inc., Port Chester, N. Y.

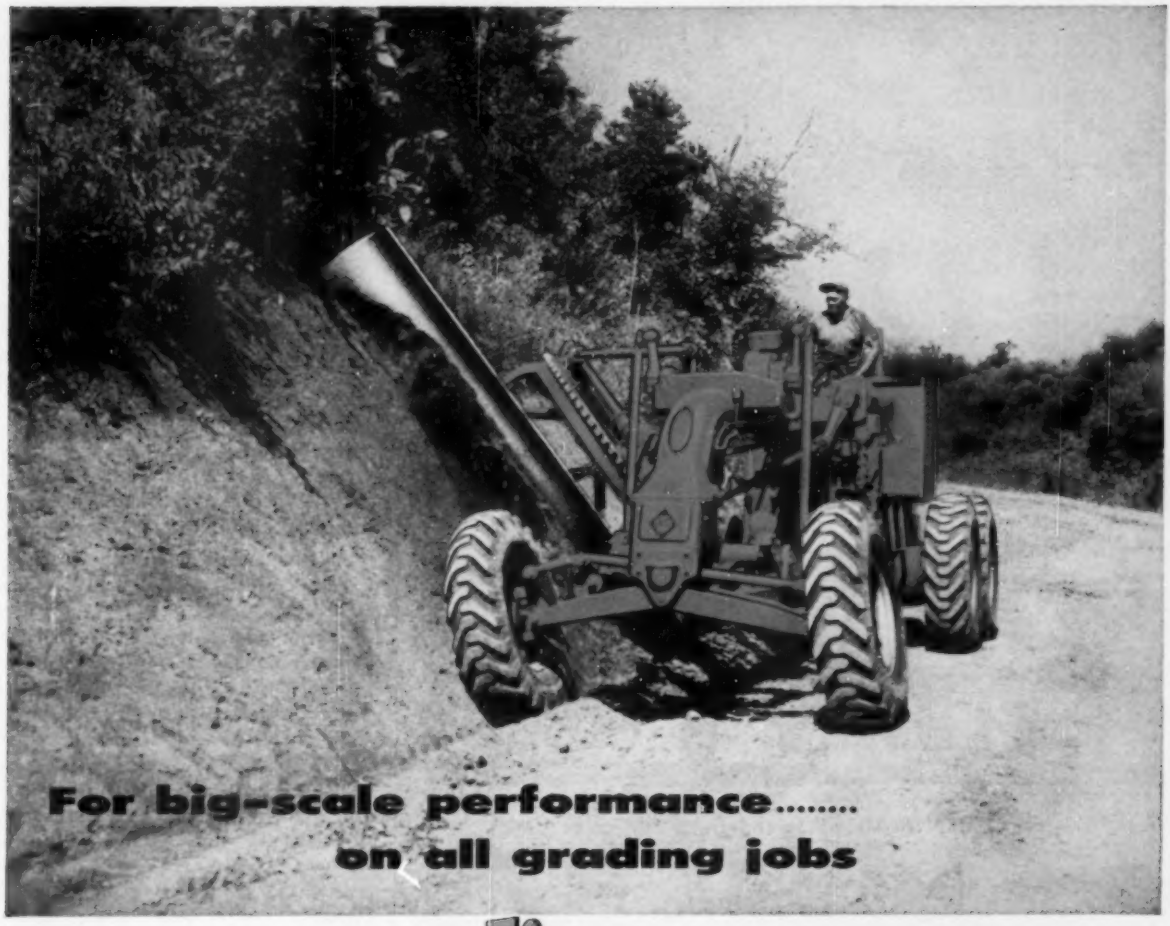
Claims: Homelite announces a new heavy-duty diaphragm pump for the pumping of mud, muck, sand and sewage. The new Model 20DP3 has a pumping capacity of 5,000 gpm.

The Model 20DP3 weighs 120 pounds. It will run six hours at full capacity pumping on one gallon of fuel.

Powered by a Homelite single-cylinder, two-cycle gasoline engine, the Model 20DP3 operates at engine speeds between 1,500 and 2,850 rpm. The throttle on the float-type carburetor can be hand-regulated to adjust engine speed for different pumping conditions—slow

Continued on page 70

"Now, about that raise, Mr. Johnson!"



SEE THE Forty Five BEFORE YOU BUY

Here's motor grader design that pays off in extra output on today's tougher, more precise jobs. You get these big advantages when you put the FORTY FIVE to work for you—more power at the wheels, more dirt at the blade, plus precision control and ease of operation.

Allis-Chalmers diesel engine with follow-through combustion provides real lugging ability . . . responds quickly to varying load conditions . . . has the power with tandem drive to pull through soft spots, roll big windrows, peel off that last inch of tough, hard dirt.

ROLL-AWAY moldboard reduces friction drag by rolling the load up and ahead of the blade edge . . . moves more dirt with less effort . . . makes more efficient use of engine power on sloping, rough grading, stripping and other heavy-duty construction and maintenance jobs.

Toggle-type controls give the operator finger-tip command of every blade position, every job. Exclusive mechanical toggle-type action provides a positive "feel," yet operation of moldboard components, scarifier and front wheel lean is accurate and easy.

Get a demonstration of the FORTY FIVE from your Allis-Chalmers dealer . . . let him show you how fully-enclosed power steering, accelerator-decelerator pedal, "box seat" comfort and visibility, and other features give you an extra measure of performance on all your grading jobs. Check the complete service program he offers you . . . factory-trained servicemen and True Original Parts for high-quality service, continued top performance and long equipment life.

Forty Five
120 brake hp
23,800 lb
6 forward speeds to 20.6 mph
3 reverse speeds to 7.0 mph

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

ROLL-AWAY is an ALLIS-CHALMERS trademark

Yes, an OWEN BUCKET swung from any crane boom will always give you:

FASTER Penetrating ACTION
when handling aggregate and loose materials;

FASTER Digging ACTION
with variable, multiplied closing power for excavation;

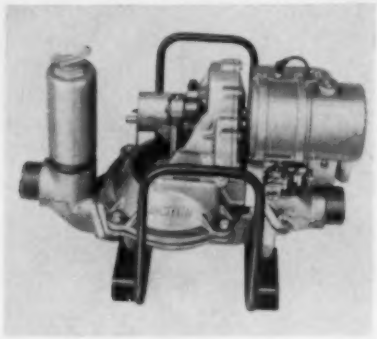
FASTER Loading ACTION
by reason of correctly engineered bowl designs with balanced power on each jaw;

FASTER Discharge ACTION
The combination of adjustable reeving and weight concentration in area surrounding lower sheave block exerting a direct pull on the cable, results in quicker opening and faster dumping.

"A mouthful at every bite"
BUCKETS AND GRAPPLES
Write for Catalog
THE OWEN BUCKET CO.
6095 Breakwater Avenue • Cleveland, Ohio
Branches: New York, Philadelphia, Chicago, Berkeley, Calif., Fort Lauderdale, Fla.

New Equipment . . .

Continued from page 68



speed for seepage control, full speed for capacity pumping. At full throttle the pump makes approximately 63 strokes per minute.

Anti-friction bearings and heat-treated, cut steel gears are used in the pump end. Gears are completely enclosed. Flapper valves in suction and discharge fittings are self-cleaning.

Completely self-priming, the 20DP3 will dry-prime up to 15 feet in 15 seconds. The guaranteed suction lift of the 20DP3 is 28 feet; its total head is 50 feet, including friction. Supplied with 3-in. fittings, the 20DP3 can be adapted for use with 2-in. hose.

Ford Loaders

Manufacturer: Tractor and Implement Div., Ford Motor Co., Birmingham, Mich.

Claims: New step-on industrial loaders for Ford and Fordson Major Diesel tractors, featuring one-piece box frame construction and high lift with high dumping clearance, have been developed by Ford. Operator convenience is a major factor in the development of the new Ford loader line. The frame design allows the operator to step on and off the tractor between the upright member and the rear wheel, instead of climbing over rear-attached implements.

The loader for the Ford tractor will

fit any NAA, 600 or 800 series Ford tractor, while the loader for the Fordson Major Diesel will fit any FMD tractor. Both can be easily and quickly installed.

The FMD loader has a rated load capacity of 1,500 pounds at full lift of 10 feet 7 inches and a breakaway lift capacity of 5,000 pounds. The rate of lift is 8 seconds at 1,800 rpm.

The Ford loader has a rated load capacity of 1,000 pounds at full lift of 10 feet 6 inches and a breakaway lift capacity of 2,500 pounds. Its rate of lift is 7 seconds at 1,500 rpm.

Both loaders have integral bumpers built into the frame. The FMD loader is equipped with double acting hydraulic cylinders to operate lift arms and to control bucket action. Down pressure on the lift arm cylinders aids in digging, scraping, leveling, filling or snow plowing. The Ford loader can be obtained with either double acting or single acting hydraulic cylinders. Both loaders have high capacity vane-type hydraulic pumps and full circulating hydraulic systems, with oil reservoirs built into the box frames for maximum cooling efficiency.

The Ford loader can be equipped with a material bucket of 9 cu. ft. capacity and a light material bucket of 16 cu. ft. capacity. The FMD loader can be equippped with a material bucket of ½-yd. capacity and a light material bucket of ¾-yd. capacity.

Submersible Sump Pump

Manufacturer: Stanco Mfg. & Sales Co., Los Angeles 25, Calif.

Claims: Flygt, a new portable, sub-

Continued on page 74

"WORLD'S STRONGEST LINK"

Actually stronger than proof-coil chain, famous Laughlin genuine "Missing Links" give an added element of safety on the job to men and equipment. Safety-conscious contractors say, "For safety's sake, we always specify Laughlin, the world's strongest split connecting link." Drop-forged from special forging steel and heat-treated, Laughlin genuine "Missing Links" are matched under pressure for a perfect fit. They are available in a complete range of sizes ¼" to 1⅞" at distributors everywhere.

SAFETY RECORD FOR CROSBY CLIPS, BLOCKS

Working efficiently means working safely. Two products designed for safety as well as efficiency—genuine Crosby Clips and Load-Rated Crosby Blocks—are helping set safety records

on projects across the country. Long-recognized as industry's safest clips, Crosby Clips, with the famous Red-U-Bolt, are specified by more construction firms than any other drop-forged wire rope fasteners.

To safeguard men and equipment, Load-Rated Crosby Blocks have the safe working capacity of each block embossed right on the sideplates. To help keep your jobs safer, insist on genuine Crosby Clips and Crosby Blocks . . . products of the Crosby Products Division, American Hoist & Derrick Co., St. Paul 1, Minnesota.

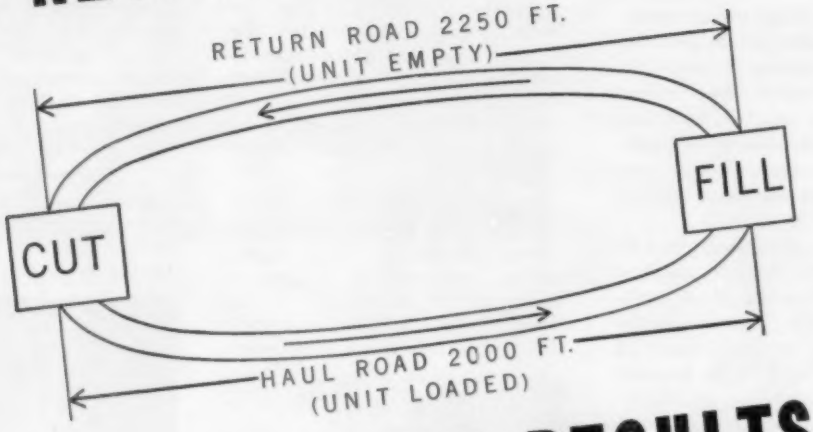
THE PERFECT COMBINATION

Maximum strength without the brittleness that can cause fracture under shock load—the result of a perfect combination of design, steel and drop forging used in Laughlin Shackles. Hefty pins are forged from the same quality steel. Your Laughlin Distributor has shackles in ⅜" to 3". sizes!

RIGGERS WANT SAFETY HOOK

Jobs where one miscue can endanger men and equipment require the safest possible equipment. To prevent loads jarring from the hook—a major cause of accidents—safety leaders specify Laughlin Safety Hooks. Drop-forged Laughlin Safety Hooks are equipped with a powerful, easy-to-operate snap spring latch that guarantees loads cannot slip or jar from the hook and prevents overloading the hook with too many lines. Here's another safe, efficient Laughlin product from the world's most complete line of fittings in all sizes for wire rope and chain. For complete catalog, write: Thomas Laughlin Division, American Hoist & Derrick Co., St. Paul 1, Minnesota, or Portland, Maine.

CONTRACTOR COMPARES "EQUALLY RATED" SCRAPERS ON JOB IN NEW JERSEY



HERE ARE THE RESULTS

	CAT* DW21-NO. 470 LOWBOWL SCRAPER	SCRAPER-UNIT A
Average load in bank cu. yd.	18.0	16.5
Total average cycle time on 4250-foot round trip	4.77 min.	5.28 min.
Trips per hour	12.6	11.3
Production, bank cu. yd./hour	227	187

LOWBOWL ADVANTAGE: 40 BANK CU. YD. AN HOUR

CAT LOWBOWL SCRAPER
OUTLOADS COMPETITION AGAIN!

Last October, when another wheel unit was needed for Thomas M. Durkin and Sons Co.'s job near Mantua, New Jersey, a new Cat DW21-No. 470 Lowbowl Scraper was matched against a new "equally rated" scraper-unit. In this test, as in other on-the-job tests under actual working conditions, the Caterpillar unit definitely outproduced competition. As a result, the company purchased the DW21-No. 470—as well as a D9 pusher.

Here's *proof* again that Caterpillar's exclusive Lowbowl Scraper design pays off in bigger, faster loads. For completely documented test facts, including names and dates, see your Caterpillar Dealer. Judge for yourself how the DW21-No. 470 Lowbowl Scraper can step up your production and profits!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

Details of on-the-job comparison!

JOB DESCRIPTION: Thomas M. Durkin and Sons Co. has a project near Mantua, New Jersey, preparing building sites, constructing streets, etc., for a 1000-home development. The company needed another wheel unit for its spread to make possible full pusher efficiency. To get a direct comparison of production, a new Cat DW21-No. 470 Lowbowl Scraper and an "equally rated" new 2-wheel scraper-unit were pitted against each other on the job under identical conditions. Here's some basic data on the units:

	DW21-No. 470	Scraper-unit A
Rated capacity, struck	18 cu. yd.	18 cu. yd.
heaped	25 cu. yd.	24 cu. yd.
Net weight	57,320 lb.	68,400 lb.
Engine horsepower rating	300	300
Scraper operation	Cable	Hydraulic

A Caterpillar D9 torque-converter Tractor and "Tractor A" were demonstrated as pushers, the D9 push-loading the DW21-No. 470 and "Tractor A" push-loading Scraper-unit A.

CONDITIONS: *Material*—sand with some clay; density 2700 lb./cu. yd., very low swell. *Loading*—level cut, sand loose but not completely "dead." *Average haul distance*—2000 feet. *Average return distance*—2250 feet. *Haul grades*—200 feet, 4% average upgrade; 500 feet, negligible grade; 1300 feet, 3% average downgrade. *Travel road*—fair; packed sand.

TIME STUDY DATA:

	DW21-No. 470	Scraper-unit A
Average loading time, min.	.59	.63
Average haul, dump, return time, min.	3.88	4.35
Total no-delay cycle time	4.47	4.98
Waits and delays, averaged between units to facilitate comparison	.30	.30
Total cycle time, min.	4.77	5.28
Average load, bank cu. yd.	18	16.5
Trips per hour	12.6	11.3
Production, bank cu. yd./hour	**227**	**187**

REMARKS: The excellent loading characteristics of the Lowbowl Scraper, plus its fast pumping cable operation, gave the No. 470 a clean-cut advantage over hydraulically operated Scraper-unit A. The DW21, with its efficient power train, made more than one extra trip an hour on the 4250-foot haul and return. Though grades were light, they slowed down Scraper-unit A, while the DW21-No. 470 took them in stride. Result: the DW21-No. 470 handled an average of 1.5 more bank cu. yd. a trip than Scraper-unit A—or the equivalent of 400 more a 10-hour day!

The new two-wheel Cat DW21-No. 470 Lowbowl Scraper

A new four-wheel DW20-No. 456 Lowbowl Scraper is also available. Both units feature the new Turbocharged 6-cylinder Caterpillar Engine which delivers 300 HP at 1800 RPM and 10% more rimpull. New Lowbowl design loads more material with less resistance clear to the end of the loading cycle. All these and other new features add up to bigger, faster loads for you with Cat Lowbowl Scrapers.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BIGGER, FASTER LOADS WITH CAT LOWBOWL SCRAPERS

New Equipment . . .

Continued from page 71

mersible pump operates partially or wholly submerged and drains to the last inch of water. Tests show that it will pump water containing as much as 40% solids, the manufacturer reports. When submerged, it is self priming and frost proof.

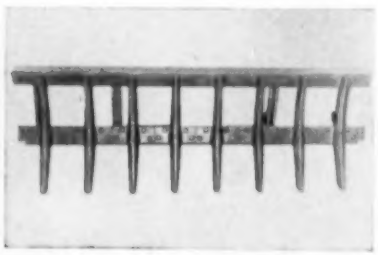
The unit consists of a centrifugal pump with rubber-lined diffusers and a suction strainer. A three-phase motor is housed in a water tight container and has a vertical spindle carried on ball bearings. An oil lock between motor and pump is created by two mechanical seals which prevent water from seeping into the motor. Water circulated around motor housing for cooling and delivery can be made through hose or fixed pipes.

Four models are available in weights from 70 to 1,250 pounds. The smallest discharges 10 gpm at 60 feet or 40 gpm at 20 feet. The largest delivers 1,500 gpm at 65 feet.

Fleco Tool Bar Rake

Manufacturer: Fleco Corp., Jacksonville, Fla.

Claims: A new Fleco rake has been designed for use with the Caterpillar D4 tractor equipped with No. 4 tool bar. This rake is matched to the speed and power of the D4 and can be easily installed on the swinging draft members

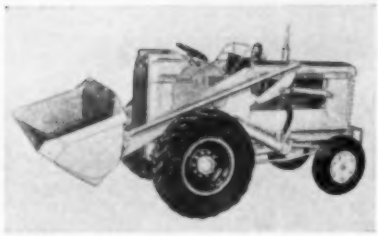


of the No. 4 tool bar. It penetrates up to 12 inches of ground and combs roots, branches and trees from the soil, stacking the debris in dirt-free piles that can be readily burned. It can also be used for removal of trees within the capacity of the D4 tractor. The Fleco rake is available from Caterpillar dealers.

Tracto-Loader

Manufacturer: Tractomotive Corp., Deerfield, Ill.

Claims: A new front-end loader has been announced by Tractomotive Corp. The 1⅛-yd. TL-11 is designed for operations requiring large lifting capacity



and ability to operate in confined areas. It has front wheel drive for better traction and is equipped with rear wheel power steering. As with all other Tracto-Loader models, it has a 3 to 1 torque converter and a clutch-type transmission which permits changes in the direction of travel without shifting gears.

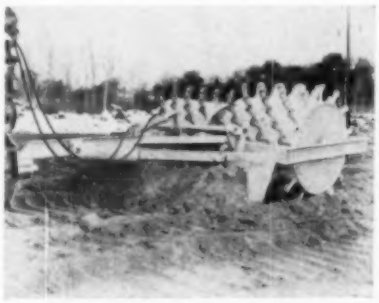
At the normal carrying height of 3 feet, the bucket can be tipped back to an angle of 41°. This carrying angle enables heaped loads to be carried without spillage. At ground level, the bucket can be tipped back 22°. Maximum clearance under the hinge pin when dumped is 10 feet 3 inches. At this dumping height the machine has a reach of 2 feet 7½ inches.

Overall length of the TL-11 with the bucket in the carrying position is 15 feet 4 inches. In this position, the machine can turn in a radius of 12 feet 3 inches. Power is furnished by either a 63-hp, 4-cylinder gasoline engine or a 77-hp, 6-cylinder diesel. A 12-volt electrical system is provided with the diesel model.

Tamping Roller Blade

Manufacturer: Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave. S.E., Minneapolis 14, Minn.

Claims: A level blade attachment to fit Bros M2 series tamping rollers has been developed by Bros. The attachment is reported to do the work of dozers and graders, achieving more uniform compaction results. By mounting directly in front of the tamping roller, it levels off the high spots and fills in low spots on the road fill, resulting in more even



compaction over the entire area of the lift covered by the roller.

The blade has a 7½-in. vertical adjustment controlled from the operator's seat, which allows lowering to five inches below the drum surface. Raising and lowering movements are made by the tractor hydraulic system through simple take-off connections. On tractors equipped with winches, they can be cable controlled. An optional hydraulic system is available to supply hydraulic control independently, if desired.

The blade is 17 inches high by 112 inches wide and has a ½-in. carbon steel reversible cutting edge which is replaceable when worn. The attachment replaces the towing tongue on present Bros rollers and has a total weight of 1,750 pounds.

Rubber-Tired Switch Engine

Manufacturer: LeTourneau-Westinghouse Co., Peoria, Ill.

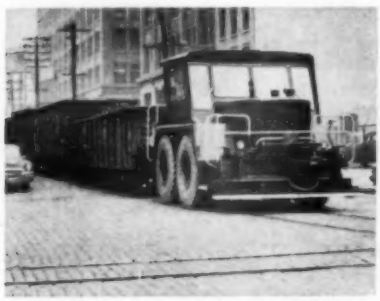
Claims: A lightweight, rubber-tired switch engine which climbs across tracks, travels on city streets and also pulls freight cars along the tracks like a locomotive has been announced by LeTourneau-Westinghouse. Designed in accordance with Interstate Commerce Commission safety regulations, the unit, known as the SwitchMobile, was built to the specifications of the Pennsylvania Railroad. The machine speeds movement of cars, both loaded and empty, to industrial plants and shippers' docks by taking advantage of its ability to travel from assignment to assignment without need of following rails.

The SwitchMobile has a 10-ft. 3-in. width and a 10-ft. 13-in. height. Its length from coupler to coupler is only slightly longer than a standard passenger automobile. Although it weighs less than 18 tons, the manufacturer reports that the greater traction provided by its rubber tires allows the machine to equal a 50-ton conventional switch locomotive in performance.

The SwitchMobile is distinctively "railroad" in appearance. Hand rails, steps, foot boards, couplers and air hoses are all identical to those found on conventional locomotives. Even the lines of its cab carry this impression. Mounted in the center of the machine, the cab has large windows all the way around to give its operator full 360° vision without blind spots.

Equipped with a General Motors 208-hp diesel engine, the all-wheel-drive SwitchMobile develops approximately

30,000 foot pounds of rimpull or tractive effort—enough to push or pull a gross weight of more than 1,000 tons from a standing start. Because it runs on large 18:00 x 25 rubber tires, it can travel across tracks without damage to signal equipment, switches, ties or rails. A wheel gauge of 8 feet 4½ inches allows it to straddle rails and run on ties as well as operating on pavement flush with rail tops when pushing or pulling cars. The low air pressure carried in the tires enables the machine to operate over ties without chamfering the ends or damaging them.



A machine that never has to back up, the SwitchMobile travels, pulls or pushes with equal power and speed in either direction. To provide this feature it is designed with a special four-speed transmission which offers the same gear ratios in both directions. A separate lever, independent of the gear change, allows quick and easy shifting from forward to reverse. A torque converter combined with the transmission provides smooth starts and allows selection of an infinite number of speed ratios from zero to the maximum.

To take full advantage of this "both-ways-forward" feature, the SwitchMobile's standard railroad air brake controls, as well as the other necessary operating apparatus, are mounted on an arm which swings laterally from a pedestal located at the center of the cab. So that the operator will have equal comfort when operating in either direction, the machine is fitted with two bucket seats, one facing in each direction on opposite sides of the cab. After selecting the direction in which he wishes to travel, the operator can quickly swing the entire control panel into position before the proper seat.

Coupling cars to the SwitchMobile is standard railroad procedure. The machine is fitted with regulation American Association of Railroads Standard Type E couplers and air brake lines both front and rear. The couplers are mounted on sliding tracks.

New Trade Literature

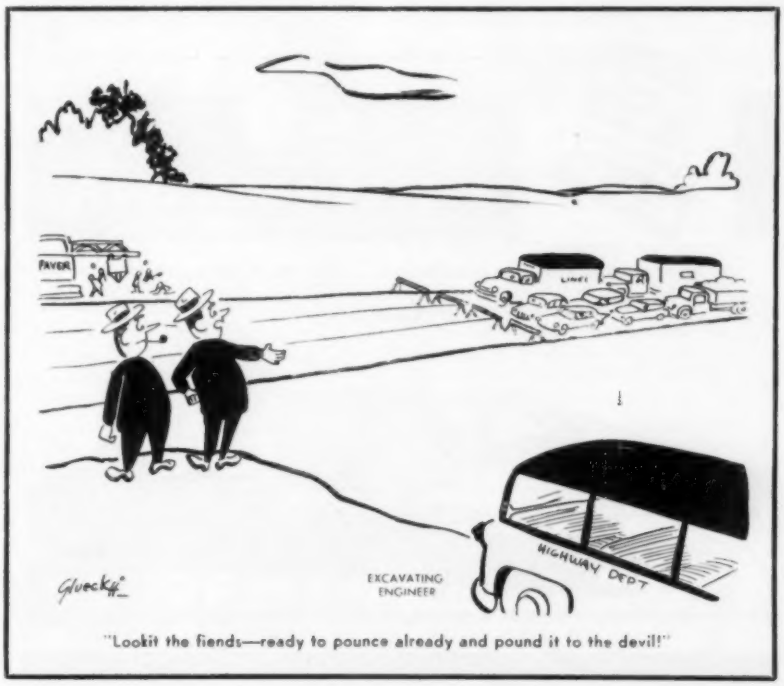
Subject: **Caterpillar Diesels**
Content: A 16-page booklet, *Why Cat Diesels Are Best*, lists some of the features incorporated in the manufacture of Caterpillar engines. Turbocharging is discussed. A schematic drawing supports the resume. Actual photographs of customer installations with accompanying testimonials are shown throughout the booklet. The booklet also is available in Spanish, French and Portuguese. Ask for booklet DE605. Caterpillar also has prepared *Road Block*, a 24-page illustrated booklet which is a companion piece to a company-produced movie of the same name. The booklet points out the need for better roads and what organizations and individuals can do about it.
Where to get: Caterpillar Tractor Co., Peoria, Ill.

Subject: **Field Engineer's Catalog**
Content: A 32-page catalog features a wide selection of equipment and supplies for field engineering. Transits, levels, range poles and leveling rods, measuring tapes, field books and all related accessories are described and illustrated.
Where to get: Frederick Post Co., 3666 N. Avondale Ave., Chicago 18, Ill.

Subject: **Allis-Chalmers Graders**
Content: A 16-page catalog (MS-459) describes and illustrates the design, engineering, construction and performance features of the Allis-Chalmers 50-hp Model D motor graders. Cut-aways, photographs of components, combustion graphs and other illustrations are used. Matched attachments and accessories are shown. Specifications of both the gasoline and diesel models are included.
Where to get: Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Subject: **Flat-Plate Batteries**
Content: Exide flat-plate batteries are illustrated and described in a folder. Known as the Exide Powerclad, the batteries feature high power and electrical efficiency. A cutaway drawing shows details of construction of the positive plate.
Where to get: Dept. PC-2, Exide Industrial Div., The Electric Storage Battery Co., Box 8109, Philadelphia 1, Pa.

Subject: **Drott Skid-Shovels**
Content: Information on the Hydro-



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Here is a comparatively recent Rogers development — a trailer designed primarily for lightness but with strength to haul loads reasonably in excess of its rated capacity.

It's priced right and is available in the popular capacities. The rear Type "T" horizontal rocking members are one of our most popular units.

Since almost every rigger and contractor should be able to use one of these trailers in addition to his present equipment, write today for complete information. Ask for the new catalog.

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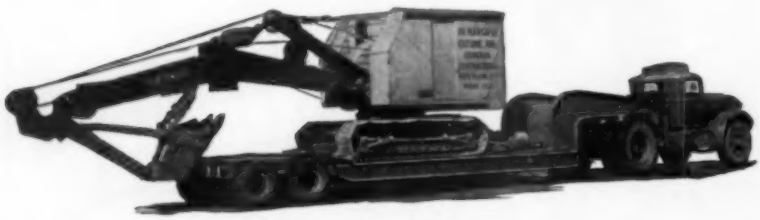


A Rogers Type "D" Trailer

Spring feature of the International Drott Skid-Shovel is contained in a bulletin. The Hydro-Spring feature, which acts as a shock cushion, is offered in four Skid-Shovel sizes ranging from 1 to 3 cubic yards, using International crawler tractors from the small TD-6 up to the TD-18 size. Ask for form CR-403-F.

Where to get: International Harvester Co., Consumer Relations Dept., 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **Timber Versatility**

Content: A 24-page booklet, *Specify Timber*, shows the versatility of timber as an engineering material for commercial, industrial and recreational structures.

Where to get: Timber Engineering Co., 1319 18th St. N. W., Washington 6, D. C.

Subject: **Steel Hut**

Content: A broadside shows the nine variations of the standard United Steel Fabricators Handy-Hut—a portable all-steel building. Also illustrated is the USF clip-and-wedge method of erection without screws or bolts.

Where to get: United Steel Fabricators, Inc., Wooster, Ohio.

Subject: **Rock Blasting**

Content: Atlas Copco has published the third regular supplement to the *Manual on Rock Blasting*. The new supplement to the two-volume manual contains latest engineering and technical reports on the calculation of charges for both bench blasting and stoping, location and design of permanent compressor plants and a review of tungsten carbide bit development and utilization in percussion drilling. In a comprehensive article on "Permanent Compressor Plants" in the supplement, John Munck of Atlas Copco Aktiebolag cautions against permitting dust, soot or other solid particles or corrosive gases from entering a compressor's intake air. "The colder the intake air," he explains, "the greater the economy of the compressor." the *Manual on Rock Blasting*, prepared in loose-leaf form in English, French, Swedish and German, was published in 1952 as an international handbook for mining, tunneling, quarrying and construction engineers. Content of the manual ranges from discussions of geological problems to mining terminology, blasting methods, compressed air sources and

tunnel and shaft ventilation practices. The work is edited by Dr. K. H. Fraenkel of the Swedish State Power Board. Copies of the complete manual, including the three supplements, are available at a production cost of $25.50. Supplement No. 3 is available separately at $3.

Where to get: Atlas Copco Eastern, Inc., Paterson, N. J., or Atlas Copco Pacific, Inc., San Carlos, Calif.

Subject: **Air Compressors**

Content: A folder illustrates the utility line of air compressors manufactured by the Kellogg Div. of the American Brake Shoe Co. Information is provided on 19 models, from 1/3 to 1¼ hp in the 125 to 150-psi range with various types of drive.

Where to get: Department A, American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.

Subject: **Huber-Warco Graders**

Content: Complete specifications sheets on two new Huber-Warco motor graders—the 102-hp 6-D and the 140-hp 7-D—are given in a 16-page bulletin. Two-page spreads and single-page layouts are used to explain outstanding features and optional equipment. One section has photographs of the 6-D and 7-D in action. Ask for bulletin HWG-521.

Where to get: Huber-Warco Co., Marion, Ohio, or from Huber-Warco distributors.

Subject: **Worthington Mixers**

Content: Based on the Worthington Company's Mixerama program, a 16-page bulletin describes and illustrates Hi-Up truck mixers. Accessibility features are illustrated. Maximum legal payload and truck mixer weight data is included. Cut-away photographs illustrate features of input shaft, gear train, clutches, output shaft, drum driving chain, transmission, brake, bearings and chain adjustment assembly. Ask for bulletin No. 1260-B1A-P.

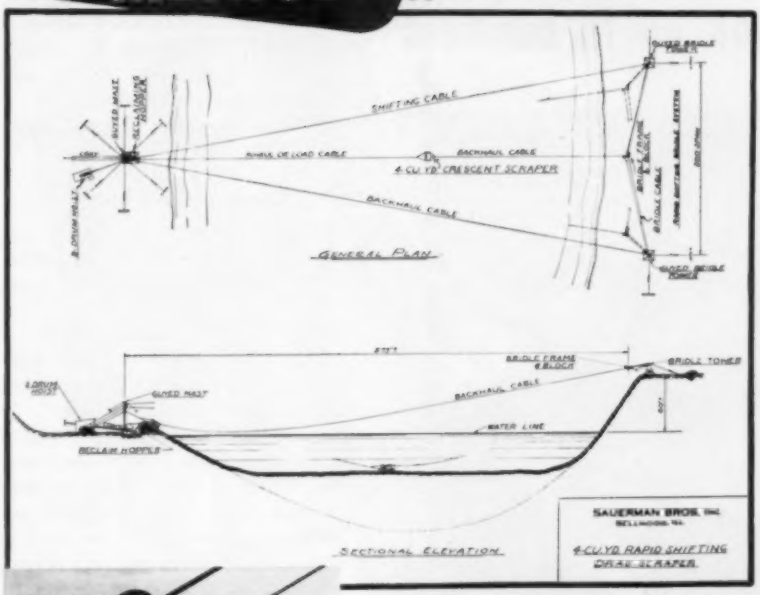
Where to get: Worthington Corp., Advertising & Sales Promotion Dept., Harrison, N. J.

Subject: **TerraTrac Tractors**

Content: *The Crawler . . . Backbone of Construction*, a 12-page booklet, explains where the American Tractor Corporation's 30 to 60-hp TerraTrac tractors fit in the construction picture. The booklet contains pictures of

the SAUERMAN METHOD....

Scraper Machines Engineered to Your Operation



Above drawing was prepared for a specific drag scraper installation and does not represent maximum spans.

View shows rapid shifting bridle frame and all operating cables. Crescent may be seen in background conveying load to reclaiming hopper just in front of mast.

•

Contact Sauerman's engineering department for specific recommendations and information. No obligation.

Ask for Catalog A, Drag Scrapers—24 pages of job photos and specifications. Request Field Reports showing your material being handled by the low cost Sauerman Method.

The Sauerman Method works equally well over widely differing areas and span limits . . . on hills, swampy ground or underwater . . . handles any material a dragline can dig.

Every scraper machine is powered by a Sauerman Roller Bearing Hoist, especially designed to withstand sudden shocks and changes in speed.

When a rapid shifter is used, a third hoist drum is added to shift the bridle frame. The rapid-shifting bridle system (upper right of drawing) permits frequent shifting of the scraper's line of operation in non-caving material, shallow excavations or overburden.

Operating costs are lower—basically, it is cheaper to drag material than it is to lift and transport it. You eliminate the power costs of moving heavy machinery about the area. You pay only for pay loads—not dead weight. When expendable parts—sheaves, clutch or brake linings—are replaced, the machine is restored to practically new condition.

Sauerman can help you select the method of materials handling most profitable for your job—a system that will give you the lowest cost per cu. yd. handled.

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Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

Here's a moderately priced rig to set you up in business

Bucyrus-Erie 20-W and 22-W churn drills offer you two profit-making opportunities. They're ideal for small *blast hole drilling* because of their speedy, snappy operation. Mobile, too, they move quickly between locations.

During the winter and other times when quarries are operating at a slow pace, these rigs can drill *water wells.* This keeps profits flowing the year around.

Effective drilling motion provides the wallop that puts down 4- to 8-inch holes rapidly. All-steel welded construction keeps repair bills low. Why not investigate the possibilities of these drills today? 52W55

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South Milwaukee, Wisconsin

TerraTrac's complete line for 1956. Five new gasoline and three diesel-powered tractors are featured, plus a complete selection of matching loaders, dozers, scarifiers and winches; a materials-handling fork lift; and two tilt-loading trailers. Information also is included on TerraTrac's torque converter drive and hydraulic power-shifting transmission.

Where to get: American Tractor Corp., Churubusco (Ft. Wayne), Ind.

Subject: **Onan Generators**

Content: The entire new line of air-cooled, portable electric generating plants recently announced by Onan is described and illustrated in a two-color folder. One section of the folder describes single-cylinder models from 500 to 2,500 watts. Two-cylinder, high-capacity generating plants in sizes of 3,500, 5,000 and 10,000 watts are discussed in another section. Complete technical data is given for each plant. Features of both engines and generators are described in detail. Optional features, such as two-wheel dollies, skids, sheet-metal housings and trailers are illustrated. Ask for Form A-406.

Where to get: D. W. Onan & Sons, Inc., Minneapolis 14, Minn.

Subject: **Wedge Anchorage**

Content: A folder illustrates a new positive wedge tensioning unit developed for Stressteel bars for use in prestressed concrete construction.

Where to get: Trucson Steel Div., Republic Steel Corp., Youngstown 1, Ohio.

Subject: **Vinyl Plastic Paint**

Content: Applications of Seal-Kote vinyl plastic all-purpose paint are discussed in a two-page bulletin. Seal-Kote is recommended for painting cement and cinder blocks, concrete, brick, asbestos shingles, wood, plaster, wallboard, celotex, stucco, all types of masonry, stone, wallpaper and asphalt. It can be applied on either wet or dry surfaces, inside or out. Ask for catalog LL-2421.

Where to get: The Wooster Sealkote Co., Wooster, Ohio.

Subject: **Hydraulic Tail-Gates**

Content: A two-page bulletin presents the operational and construction features of Hercules Model H-11 series Load-N-Gate power-lift hydraulic tail-gates. Covering both electric-hydraulic and power take-off driven models of 1,100-lb. capacity, the bulletin lists suggested applications. Condensed specifications are also included. Ask for Catalog 152.

Where to get: Hercules Steel Products Co., Galion, Ohio, or Hercules distributors.

Subject: **John Deere Tractors**

Content: A booklet describes and illustrates the new line of John Deere industrial tractors and equipment.

Where to get: John Deere Industrial Div., Moline, Ill.

New Movies . . .

Subject: **Euclid Dump**

Content: A 16mm sound film, *Under the Shovel,* has been produced by Euclid to show the job application product features of its Model UD, smallest (10 tons) Euclid rear dump being manufactured.

Where to get: Euclid distributors or Euclid Div., General Motors Corp., Cleveland 17, Ohio.

Subject: **Detroit Dam**

Content: The Portland District, Corps of Engineers, has available for showing by clubs, schools and other groups in the Pacific Northwest a 29-minute sound color film showing the progressive construction of Detroit Dam on the North Santiam River in Oregon. The 16mm film, entitled *Challenge of the North Santiam,* includes footage on Big Cliff reregulating dam, which is part of the Detroit project, 2½ miles downstream from the parent project. The film is obtainable on loan. Information folders on the Detroit project also are available.

Where to get: (Film) Division Engineer, North Pacific Division, 210 Custom House, Portland 9, Ore.; (Folders) District Engineer, Portland District, 629 Pittock Block, Portland 5, Ore.

Subject: **H. K. Porter Co.**

Content: *Serving Industry* is a movie about H. K. Porter Co., Inc., and its divisions. Shown are the growth of Porter and the manufacture of many of its products and how they are used. The film is available to companies, business and financial groups and other organizations.

Where to get: Box MP, H. K. Porter Co., Inc., 300 Park Ave., New York 22, N. Y.

Massachusetts . . .

Continued from page 21

each side of the road. Six maintenance and three police areas will be established.

In its first full year of operation, 1957, the traffic load on the Turnpike is expected to total about 15,970,000 vehicles, with anticipated tolls of $14,510,000 and anticipated concessions revenue of $726,000. By 1994, traffic is expected to increase to 29,370,000 vehicles, with tolls of $26,680,000 and concessions revenue of $1,334,000.

Great Glacier Factor

Building east-west highways across Massachusetts is expensive. The prehistoric Great Glacier visited the Bay State and left a series of alternating low ridges and valleys to serve as problems for the designers of highways.

The elevation of the Turnpike route ranges from about 75 feet in the Connecticut River Valley to about 1,700 feet in the Berkshires.

Soils in the 35-mile western section include silts and clayey silts with some stony phases and rough stony land with shallow overburden. Bed-rock primarily is either dolomitic limestone and granite gneiss with some schist; in the six miles between Blandford and the Westfield River, where the elevation varies 1,100

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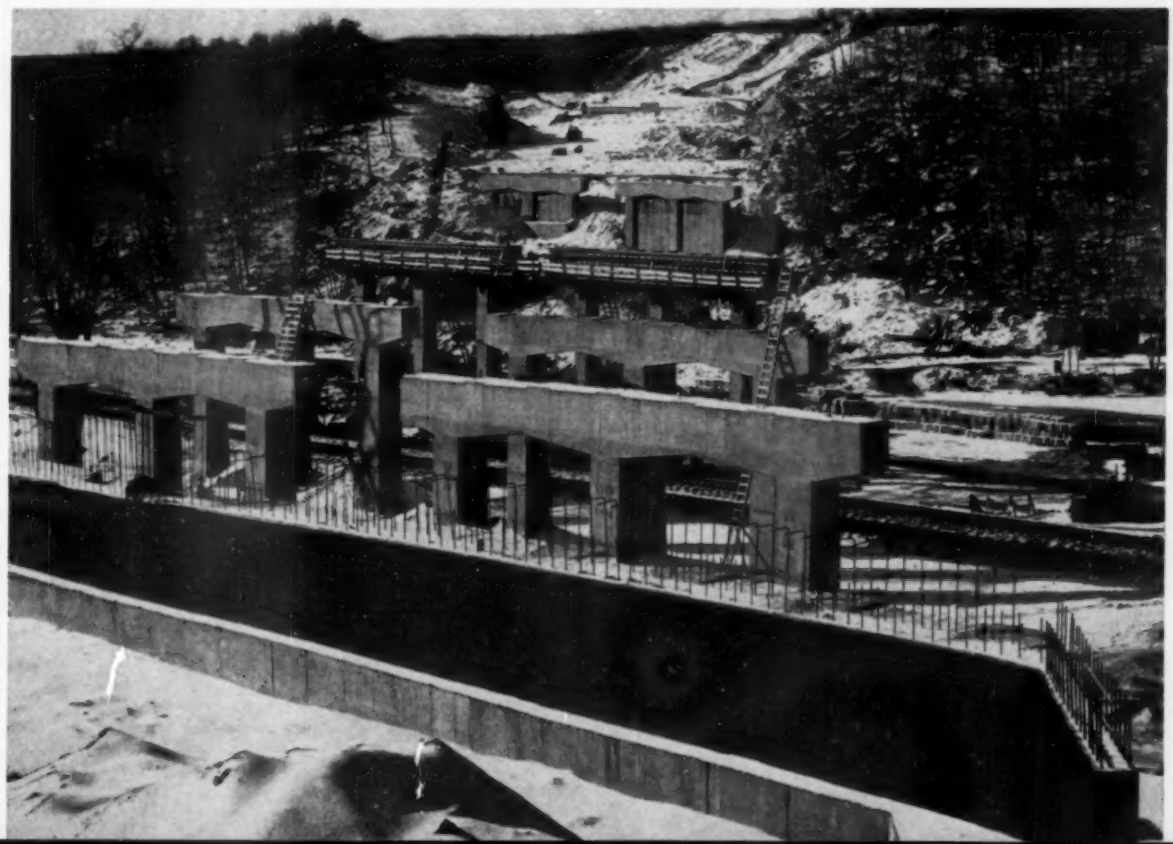
Concrete piers for the Quaboag River Bridge over the Quaboag River and tracks of the B. & A. railroad are 50 to 60 ft. high.



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feet, much rough, stony land with shallow overburden is found, along with some areas of stony, fine sand.

Sandy soils with varying degrees of gravel and some stony deposits are found between the Westfield River and the East Mountain ridge in the central section. Relatively deep deposits of highly complex and variable sandy to silty materials are found between the ridge and the Connecticut River. Medium to fine sands with some stone and gravel are found between the Connecticut and Chicopee rivers. The central section is 23 miles long.

Soils consisting largely of sandy and granular materials of glacial till origin are found in the 60-mile eastern region.

Excavation for the Turnpike will total about 40 million yards, including about 6 million yards of rock.

Consultants to the Turnpike Authority include: Howard, Needles, Tammen & Bergendoff, general consultant; DeLeuw, Cather & Co., traffic & revenue consultant; Coverdale & Colpits, consulting engineers.

Section engineers include: DeLeuw, Cather & Brill; Brown & Blauvelt; Thomas Worcester Corp.; Howard, Needles, Tammen & Bergendoff; Knappen-Tippetts-Abbett-McCarthy; Charles A. Maguire & Associates; Charles T. Main, Inc.; Fay Spofford & Thorndike; Hayden, Harding & Buchanan; and The Clarkeson Engineering Co.

Members of the Massachusetts Turnpike Authority are William F. Callahan, chairman; Benjamin H. Grout, vice chairman; and John R. Kewer, member. Philip H. Kitfield is chief engineer.

Groves . . .

Continued from page 27

complished in two large aluminum buildings.

Lubrication is handled in the field by a Grayco unit mounted on a Ford truck. Diesel fuel is transported to equipment on two Ford trucks. Welders use Lincoln welders.

Liaison and service tasks are charged to about 30 Dodge Power Wagons, Jeeps and Ford pickups. All-wheel-drive on these vehicles was virtually a necessity in the early days of a project that presented steep haul roads and rugged advance areas.

Even while he was being interviewed, Day kept abreast of developments on the job through use of a General Electric 75-watt radio system. The office and shop are on the system, along with about 15 mobile units.

Day is working on his third turnpike for S. J. Groves. In addition to the West Virginia project, he worked on the New Jersey Turnpike. Day spent 3½ years in Mexico on an irrigation project. Before that he was a stripping superintendent in the Minnesota iron country.

Day's staff on the Massachusetts job includes: Don Blake and Joe Garren, superintendents; Pete Sprenger, engineer; O. E. Miller, office manager; Bob Darden, master mechanic; Ed Wiuff, shop foreman; Hard Rock DeWitt, blasting superintendent; and Pat Wiggins, drilling superintendent. Thomas Worcester Corp., Boston, is the engineer for the two Groves sections. William McQueen is Worcester's resident engineer.

"I still think it would be quicker to go back to town after matches."

Salt Lake . . .

Continued from page 39

many sections on Hilton & Carr's work where this was necessary.

One of the most unique excavating operations in the project was that of Kloepfer Construction Co., a firm which specializes in sewerage and other pipeline work. Over the years, Kloepfer has learned the importance of mechanizing all operations on such a job, and this one reached a new peak in that regard.

An unusual example of mechanization on Kloepfer's work was the mounting of a Bucyrus-Erie H-3 Hydrohoe on a war-surplus White halftrack. Kloepfer decided on the halftrack mounting because much of his work for the last three years has been in the marshiest areas of Salt Lake City. The firm's current contract on the sewerage system was approximately in the center of the project, in some of the softest, gooiest mush. Kloepfer moved in with his halftrack-mounted Hydrohoe in places that would have mired an ordinary truck. The halftrack mounting floated the machine over the surface of the ground.

Principal use for this rig was the complete mechanization of lateral sewer-line construction. Kloepfer eliminated practically all the hand labor around this operation. If a lateral passed underneath a sidewalk, for example, with excavated ditch on both sides, the Hydrohoe dug it neatly and quickly. According to Eldon Kloepfer, head of the firm, there was one location where two telephone cables, four high-pressure water lines and one gas main were located next to a sidewalk, all within a 25-ft. distance. This entire excavation was made without hand labor and was done rapidly. Kloepfer used a 24-in. dipper built up to about ⅜-yd. capacity, on the machine.

In a pinch, should the company ever want to change the mounting, the removal of about 10 bolts in the Hydrohoe's base will allow it to be lifted off and replaced on a conventional truck mounting. The old war surplus White halftrack has proved to be quite an over-the-road machine. Kloepfer has sometimes sent the rig on 53-mile trips.

Uses Metal Skip

Another of Kloepfer's excavating innovations was the use of a metal skip for placing bedding gravel in the bottom of the sewer trenches where cushion material was called for. This skip, made up from a curved piece of old sheet iron, was slightly longer than a truck bed is wide. Placed longitudinally at the end of a truck bed, the skip was quickly loaded by gravity dumping from the truck. When gravel was needed, the dragshovels on the job reached back, picked up the skip load of material, dropped it down to the bottom of the trench, and then by releasing one front cable, dumped the material in a neat line just under the pipe grade.

Kloepfer's equipment list included two Bucyrus-Erie 22-B dragshovels, the halftrack-mounted Hydrohoe, an Austin-Western Badger, an International TD-9 tractor, a TD-18 and a Caterpillar D7 for backfilling. Kloepfer also used an Austin-Western Patrol with a front-end dozer for backfilling, particularly on laterals. There were four dump trucks which carry away excess material, several water wagons and eight company pickups. Kloepfer's spread was completely equipped with Motorola two-way radio communication. The system helped to increase efficiency since Kloepfer's spread, like the others, was greatly strung out.

Kloepfer's 25-mile job included vitrified clay, concrete and Transite pipe ranging from 4 to 12 inches in diameter. Average depth of trench under

In a Hayward, there's no contact between the closing mechanism and the gravel or other materials handled. To be sure—this "no contact" feature is only one advantage. But a very important one to you—since it means much less wear, reduced upkeep, and a significant dollar-saving in bucket maintenance.

The Hayward Company, 50 Church St., New York 7, N.Y.

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CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

An Allis-Chalmers HD-5 Tracto Shovel backfills close behind a Northwest 25 backhoe on a section of Salt Lake's sewer project.

this contract was 10 feet, with a maximum of 18 feet. Practically all of Kloepfer's digging was extremely wet and soggy, so that the use of Worthington, Gorman-Rupp and McGowan pumps was a necessity. Like the other operators, Kloepfer kept his contract closed up tight, principally to minimize hazards to children in the neighborhood.

Tight Pipe Joints

According to engineers of the design firm, some of the tightest pipe joints, so far as infiltration was concerned, were put up by Statewide Plumbing & Heating Co. of Murray, Utah. This firm also had one of the contracts under the District 1 program. There were men on Statewide's pipe crews who had many years of experience in pipeline-joint work, so that they recognized fully the importance of laying the joint even, of packing the jute ring tight and of having the sealing rope positioned properly to contain the hot asphalt as each joint was laid. According to Statewide's pipeline men, these simple fundamentals properly followed almost always deliver a perfect job.

The Statewide contract was sufficiently similar to the other jobs so that organization and methods were somewhat the same. For excavating equipment, Statewide used a fleet of Link-Belt Speeder backhoes, with International and Caterpillar tractors for backfill.

Work Moved Rapidly

Construction work moved very rapidly so that many parts of the system are already in use. New residences hard-pressed for some measure of sewage disposal are finding welcome relief from that problem as each new day unfolds.

Design engineering and supervision of the entire sewer-building program is under Alton H. Sorensen. He is assisted at field level by Charles Kelly, project engineer, and G. E. Torgersen and I. H. Haslam.

Contractor's operations during 1955 were largely under the personal supervision of the heads of the contracting firms. On the main outfall line, Paul Vukich had personal charge of the work. Eldon Kloepfer of Kloepfer Construction Co. supervised his firm's work. Hilton & Carr's operations were under the personal supervision of partners J. S. Hilton and Fred Carr, Jr. Supervision of the Statewide Plumbing & Heating Co. job was under Ken Balis, and the Schmidt-Tiago contract under Jack Cook, general superintendent.

Los Angeles . . .

Continued from page 33

partment must refer applicants to the Board of Commissioners for a formal hearing in cases where its engineers believe the issuance of a grading permit would create a dangerous condition. The Department is enjoined against being "arbitrary or capricious" in refusing any permit, but the language is plain in the regulations when it spells out that grading is a matter of public concern, and that permits should be issued only when ensuing excavation will work no harm either in or out of the permit area.

Rules Well Received

The new rules have been well received, by contractors, home owners, and tract developers and subdividers, according to Department officials. Administration of the regulations is handled by the Department, which now makes a site inspection a prerequisite to issuing a building permit for individual lots in hillside areas. In about 40% of the cases, these inspections reveal the necessity for diversion of drainage water, for retaining of earth slopes, or for specially designed foundations.

Owners and their agents are required to obtain a permit for any excavation over five feet in depth, or for any fill over three feet deep. Fees for these grading permits are calculated at $10 for the first 1,000 cubic yards, plus $3 for each additional 1,000 cubic yards. Permit applicants are required to submit a contour map showing both present contours and final contours after the grading has been completed. In general the Department limits cut face slopes at 1:1, and requires 90% of Modified AASHO compaction in fill areas. Fill area slopes generally can be no steeper than 1½:1. Where especially dangerous conditions exist, the Department sets even more stringent requirements, as determined by its engineers. Cut slopes can be steeper than 1:1 only if competent engineering firms approved by the Department certify that they are stable on a steeper grade.

Requests to copy the regulations have begun to come in from other parts of the United States and the world. The way the regulations have been received is encouraging, according to Department officials, because it shows that excavation is just as much a matter of community concern as police protection, uncontrolled fires or human welfare.

Key Officials

Key officials responsible for the far-reaching accomplishment include, among others, Norris Poulson, mayor of Los Angeles; John M. Ennis, president of the Board of Building and Safety Commissioners; G. E. Morris, superintendent of building; and Hanley A. Wayne, assistant chief of the Building Division.

A Lull Shoveloader cleans up storm debris from a winding street in an exclusive Los Angeles residential district. Improved grading practices will help control soil erosion.

Notes from the Manufacturers

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed Myron W. Rhoten as managing director of Allis-Chalmers Great Britain Ltd., the wholly-owned Allis-Chalmers subsidiary with headquarters in Essendine, England. He succeeds E. J. Mercer, who returned in January to become general manager of the A-C Tractor Group's Construction Machinery Div. Rhoten joined Allis-Chalmers in 1938. Mercer has been with the firm since 1937.

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed Oehlert Tractor & Equipment Co., Inc., Salina, Kan., to offer sales and parts service on Bucyrus-Erie excavators and cranes in the northwest section of Kansas. The new distributor will handle the full line of ⅜ to 4-cu. yd. convertible excavators and cranes; 15 and 25-ton Transit Cranes; ⅜ and ½-yd. truck-mounted Hydrocranes; the Hydrohoe; and Bucyrus-Erie dragline buckets. Oehlert's territory includes the following counties: Cheyenne, Rawlins, Decatur, Norton, Phillips, Smith, Jewell, Sherman, Thomas, Sheridan, Graham, Rooks, Osborne, Mitchell, Wallace, Logan, Gove, Trego, Ellis, Russell, Lincoln, Ottawa, Ellsworth, Saline, Dickinson, McPherson and Marion. Complete equipment servicing facilities will be maintained at the distributor's plant at 201-03 W. Pacific in Salina, Kan. Sales and service will be offered at branch plants in Hays and Colby.

Caterpillar Tractor Co., Peoria, Ill., has appointed Robert J. Dawson, 35, as manufacturing manager of its new plant in Glasgow, Scotland. Previously, Dawson was assistant factory manager of Caterpillar's engine factory at Peoria. Also appointed to posts at the Glasgow plant were Hans G. Frommer, as production manager, and William I. Cusson, as superintendent of assembly. The Glasgow plant will manufacture D8 and D4 crawler tractors. Dawson has been with the company since 1939, Frommer since 1946 and Cusson since 1940.

Chain Belt Co., Construction Ma-

"I'm one ahead of Uncle. They forgot to deduct income tax and social security from my pay!"

chinery Div., Milwaukee, Wis., has appointed two new distributors of Rex construction machinery. They are the Illinois Tractor Co., Salem Road at Stanley Ave., Mt. Vernon, Ill., and P-D Service, Inc., Pavilion, N. Y., and 237 Kennsington, Buffalo, N. Y. Illinois Tractor Co. territory includes that part of Illinois east of and including the counties of Bond, Clinton, Washington, Perry, Jackson, Union and Alexander and south of and including the counties of Marion, Clay, Richland and Lawrence. P-D Service, Inc., will serve as a distributor in that part of New York state west of and including the following counties: Wayne, Seneca, Schyler and Steuben.

Clark Equipment Co., Benton Harbor, Mich., has appointed three firms to handle its Michigan line of tractor shovels and excavator cranes. They are Merts Equipment Co., P. O. Box 331, 300 S. Slappey Dr., Albany, Ga.; Mainline Equipment Co., Inc., 818 S. W. Ninth St., Des Moines, Iowa; and R. A. Young & Son., Inc., 301 S. 10th St., Fort Smith, Ark. Merts Co. will serve the Georgia counties south of and including Chattahoochee, Marion, Schley, Macon, Dooly, Pulaski, Dodge, Wheeler, Montgomery, Toombs, Tattnall, Evans, Appling, Pierce, Brantley and Charlton. Mainline Equipment will handle the Iowa counties east of and including Dickinson, Clay, Buena Vista, Sac, Carroll, Audubon, Adair, Union, Ringgold and west of and including Worth, Cerro-Gordo, Franklin, Hardin, Marshall, Jasper, Marion, Monroe and Appanoose. R. A. Young will handle all of Arkansas except for the counties of Clay, Green, Craighead, Mississippi, Poinsett, Cros, Crittenden, St. Francis, Lee, Phillips, Chicot, Ashley, Union, Columbia, Lafayette and Miller.

Colorado Fuel and Iron Corp., New York, N. Y., has moved its Chicago district sales office and warehouse to larger quarters at 3838 W. 51st St., Chicago 32, Ill. L. J. Renner is district sales manager.

Cummins Engine Co., Inc., Columbus, Ind., has appointed W. M. Steed as regional manager, Southwest Region, with offices in Los Angeles, Calif. His headquarters will be in the Equitable Life Building, 411 W. Fifth St. The Cummins Southwestern Region includes California, Arizona and Nevada.

Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich., has appointed D. W. Radebaugh as sales promotion manager. He succeeds T. L. Guarniere, who recently was named merchandising manager. D. P. Gosheff has been appointed sales representative of the Detroit Diesel Engine Div. of General Motors-Florida branch. He will co-ordinate the diesel sales activities of Florida marine and industrial dealers with operations at Detroit Diesel branch headquarters at Miami and the sub-branch at Jacksonville.

Euclid Div., General Motors Corp., Cleveland, Ohio, has appointed the following regional sales managers in charge of Euclid product distribution and policy administration: John A. Polhemus of New York, Eastern region, with a territory including eastern Canada, Maine, Vermont, New Hampshire, New York, Massachusetts, Connecticut, Rhode Island, New Jersey, Maryland, Delaware, District of Columbia and eastern Pennsylvania; J. E. Ehlert of Cleveland, Ohio, home district, with a territory including Ohio, Michigan, Indiana and western Pennsylvania; E. C. Dellen of Kansas City, Mo., Central Region, with a territory including North Dakota, South Dakota, Wyoming, Colorado, Arizona, New Mexico, Oklahoma, Kansas, Nebraska, Iowa, Missouri, Illinois, Wisconsin and Manitoba; C. B. Pace of Atlanta, Ga., Southern Region, with a territory including Texas, Arkansas, Louisiana, Mississippi, Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, Kentucky, West Virginia and Virginia; R. M. Brown of Hibbing, Minn., Hibbing Branch, with a territory including Minnesota and the western part of the Upper Peninsula of Michigan; M. H. Johnson of Oakland, Calif., Western Region, with a territory in-

Continued on page 86

"Really, Ma, it isn't necessary for you to bring my lunch to me every day."

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

SHOVELS — DRAGLINES
DRILLS
TRACTORS — TRUCKS

190-B Bucyrus-Erie elec. 8 yd. shovel
170-B Bucyrus-Erie elec. 6½ yd. shovel
1600 P&H 6 yd. electric shovel
2400 Lima 6 yd. diesel shovel
120-B Bucyrus-Erie elec. 5 yd. shovel
111-M Marion 3½ yd. diesel shovel
955 P&H 2½ yd. diesel shovel
7400 Marion electric dragline 200′ boom, 8 yd.
625 Page diesel dragline 150′ boom, 9 yd.
2400 Lima diesel dragline 130′, 5 yd.
4500 Manitowoc diesel dragline 120′ boom, 5 yd.
111-M Marion diesel dragline 80′ boom, 4 yd.
1055 P&H diesel dragline 80′ boom, 4 yd.
3500 Manitowoc diesel dragline 85′ boom, 2½ yd. bucket
600 Reich Heavy truck mounted rotary drill
Quarrymaster Drill with 2—500 cu. ft. compressors
58-BH Joy Champion Rotary Air Drill
56-BH Joy Middleweight Rotary Air Drill
Also 42-T, 29-T, and 27-T Well Drills

Euclid Trucks—Many to Choose From

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

Dragline equipment for Bucyrus-Erie 120-B with 90′ boom, boom and hoisting machinery, etc., and 5 yard dragline bucket; Price: $10,000. Equipment may be inspected at the BASALT ROCK CO., INC. Plant, Napa, Calif.

Lima 2400 dragline equipped with 110′ boom, two 7-yard Hendrix HS buckets, one 6-yard ESCO bucket, Kohler light plant; machine powered with Caterpillar D-397 diesel engine; 63" wide treads; long caterpillar frames; machine shipped September 1950; completely overhauled June 1955; engine completely overhauled April 1955; Approximately $5000 in spare parts available; Price, as is where is, $115,000. Box 3677

Bucyrus Monighan 6160 electric dragline and Bucyrus Erie 50-B electric horizontal thrust coal loader; trail cables included; Price of dragline: $175,000; coal loader: $25,000; f.o.b. mine southeast of Clay City, Indiana. North American Mining Co., Clay City, Indiana.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Bucyrus-Erie 200-W diesel dragline shipped in 1950; 125 ft. boom, 6 yd. heavy duty and 7 yd. light weight buckets; some spare parts included; good mechanical condition. Location Melbourne, Australia. Box 3682.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 54-B 2½ yd. standard shovel front only, complete including deck machinery and bucket; excellent condition; Price $5,000; dealers protected. J. P. MacFarlane, 605 Mellon Bank Bldg., Butler, Pa., Phone 74033.

Dragshovel attachment model 25 Northwest; like new condition. The W. T. Walsh Equipment Co., 12750 Berea Rd., Cleveland 11, Ohio.

LORAIN Model 820—2 yd. Shovel with Waukesha Diesel Engine Ser. No. 17695. Good operating condition $25,000

Also available—Bucyrus-Erie 38-B—1½ yd. shovel front only, in operating condition $3,600

H. O. PENN MACHINERY CO., INC.
140th Street & East River
New York 54, New York

MISCELLANEOUS EQUIPMENT

SURPLUS—3 Athey DC31 Quarry Wagons, side dump, 11 cubic yard heaped capacity; used very short time; excellent condition; priced right.

KAISER-NELSON CO.
6272 Canal Road — Cleveland 25, Ohio

2—Complete sets of Koehring 304 clamshell lagging; 1—Koehring 304, 15′ jib; 1—Koehring 304, fairlead; 2—22-B Bucyrus-Erie dragshovel padlocks complete; everything 50% off. The Harry Miller Excavating Co., Suffield, Ohio. Phone: ORchard 3-4111.

MISCELLANEOUS EQUIPMENT

8 CATERPILLAR DW20 TRACTORS
with
CATERPILLAR No. 20 SCRAPERS
Excellent Condition—well cared for machines. May be bought "As is" for $23,500 each or we put in "Rebuilt Condition" for ..... 25,000 each

H. O. PENN MACHINERY CO., INC.
140th Street & East River
New York 54, New York

Used 10-B attachments from 10-B #14755.
Like new backhoe attachment—$750.
Standard 28′ dragline boom—$100.
Dragline Fairlead—$100.
¾ Yard dragline bucket—$100.
Shovel front, fair condition—$150.

McCANDLESS CONSTR. CO.
1750 Kearney Street Springfield, Missouri

Bucyrus-Erie Model 22-B, ¾ yd. shovel, with Caterpillar D-318 Diesel engine. Good condition. Can be seen at Waite yard.

Link Belt Model LS-90, 1 yd. shovel with Waukesha gas engine. Excellent condition, less than three years old. Very good buy. Waite yard.

Gradall—Model 2460, mounted on K-8 International truck chassis. 36" digging bucket. Very good condition; repacked and repainted. Waite yard.

Quickway—Model E Clamshell—Dragline Combination, mounted on Oshkosh 4-wheel drive truck carrier. Both truck and upper assembly overhauled less than 200 hours ago. Priced right. Located in Milwaukee; call for appointment to inspect.

Quickway—Model J back hoe—Shovel Combination. Very good condition. Priced to sell. Waite yard.

Michigan T-6-D rubber mounted shovel. Good condition. Priced right. Waite yard.

Lorain—Model 75, 1 yd. shovel. Old but good—a real rock shovel. Priced right.

H-3 Hydrocrane, mounted on L-162 International truck chassis—equipped with operator's cab, hydraulic tagline reel, clamshell. Very good condition. Waite yard.

H-2 Hydrocrane with clamshell bucket, tagline reel; as is, or rebuilt. Priced right. Waite yard.

Insley—Model 12, ¾ yd. back hoe; good condition; call for appointment to inspect.

Schield Bantam—Model 49 back hoe, mounted on tandem axle truck with 6-wheel drive. Good working condition—a bargain. Waite yard.

TD-6 International dozer-loader combination; very good condition. Priced to sell. Waite yard.

Caterpillar D-6 Bulldozer, Diesel power, narrow gauge; excellent condition; priced to sell quick. Call for appointment to inspect.

Caterpillar D-4 Bulldozer, wide gauge hydraulic blade, new street plates, current series model; perfect condition; priced right. Call for appointment to inspect.

Parson Trench Machine Model 25, equipped with full crawlers, Waukesha engine; perfect water pipe machine; excellent condition; approximately ¼ of today's cost. Call for appointment to inspect.

Paige RC Automatic Dragline Bucket, 1¼ yd. capacity; very good condition; priced for quick sale.

J. P. WAITE CONSTRUCTION CO.
3308 West Pierce St. Milwaukee 15, Wis.
Phone EVergreen 4-1900.

MISCELLANEOUS EQUIPMENT

TRUCK CRANE

BUCYRUS-ERIE 22-B truck crane combination clamshell and lifting crane, 35' boom, pendant suspension and Rudomatic tagline mounted on six wheel drive truck with 12:00 x 20 tires; rebuilt condition. Price: $15,000. H. O. PENN MACHINERY CO., INC., 140th St. & East River, New York 54, New York.

34E Foote Dual Drum Paver; new in 1947; good operating condition; new Hercules gasoline engine installed recently; serial No. 46D113. Contact Galier Bros., 4106 Mayfield Rd., South Euclid 21, Ohio.

1—Reel New Tramway Track Rope 2" diameter, Leschen Style B, flattened strand mild plow, 575 feet long .....Price $495 F.O.B., Stearns Coal and Lumber Co., Inc., Stearns, Ky.

FOR SALE

SURPLUS—1¼ yd. Owen Clamshell Bucket, Type M, size 236, Serial No. 20036. Not used since factory rebuilt. Will sacrifice for $1,200.

KAISER-NELSON COMPANY
6272 Canal Road **Cleveland 25, Ohio**

POSITIONS WANTED

Highway construction foreman desires position in South America; have had four years highway surveying and twelve years as highway construction foreman; any part of South America. Evan R. James, 140 N. Second St., St. Clair, Pa.

Superintendent available; 30 yrs. experience and qualifications covering all types of sewers, water lines, highways, airports, heavy and light excavating, earth fill dams; know cost, plans and specifications, materials, labor and modern equipment; honest, sober and reliable; best of health and a pusher; available for any part of the U.S.A. Box 3684

HELP WANTED

EXPERIENCED EXCAVATOR SERVICEMAN FOR TRAVEL IN LATIN AMERICAN COUNTRIES

PROMINENT EXCAVATOR MANUFACTURER HAS OPENING FOR CAPABLE MAN EXPERIENCED IN SHOVEL AND DRAGLINE OPERATION AND MAINTENANCE. MUST SPEAK SPANISH FLUENTLY. MUST BE AN AMERICAN CITIZEN AND WILLING TO TRAVEL. SEND COMPLETE INFORMATION ON BACKGROUND AND REFERENCES WITH RECENT PHOTOGRAPH TO EXCAVATING ENGINEER. BOX 3681

HELP WANTED

Superintendent for stripping job who understands large draglines and their operations; give age, experience and references in first letter. Box 3688

CIVIL ENGINEER

Need man with initiative and drive; construction survey, estimating and layout; expanding Midwest organization—opportunity; degree not required; experience in marine construction helpful but not essential; salary open depending on applicant; replies confidential; advise personal data, work and educational background, salary expected. Box 3687

If you are Buying or Selling Used Equipment, this is the place to let the Excavating Industry know about it.

Notes . . .

Continued from page 84

cluding Utah, Oregon, Nevada, California, Montana, Idaho, Washington, Alaska and western Canada. Euclid also announced that factory training covering trouble-shooting, maintenance and service methods for all Euclid earth moving equipment would be held from April 30 through June 25 at the General Motors Training Center, San Leandro, Calif. The classes will be open to Euclid owner and dealer service personnel in the area.

L. B. Foster Co., Atlanta, Ga., has added William A. Stovall and Herbert E. Waterhouse as sales representatives in the Atlanta office. Stovall will specialize in buying and selling steel pipe.

Gar Wood Industries, Inc., Wayne, Mich., has appointed Bert Royce as a field representative for Gar Wood-Buckeye in the South and Southwestern parts of the United States. Royce has been with Gar Wood-Buckeye for 45 years.

Goodyear Tire & Rubber Co., Akron, Ohio, has appointed J. W. Smith as Eastern sales manager of its Industrial Products Division. He replaces O. A. Schilling, who was promoted to manager of the division's industrial products departments. J. L. Sinclair, manager of Goodyear's Industrial Products district office at Cleveland, Ohio, is being transferred to the Chicago district as manager. R. J. Ario will replace Sinclair at Cleveland. Ario has been district manager at Charlotte, N. C., since 1952.

Hewitt-Robins, Inc., Stamford, Conn., has appointed William B. Hicks as manager of sales development in the rock products industry. He will assist in the development of sales to sand and gravel, crushed stone and cement companies.

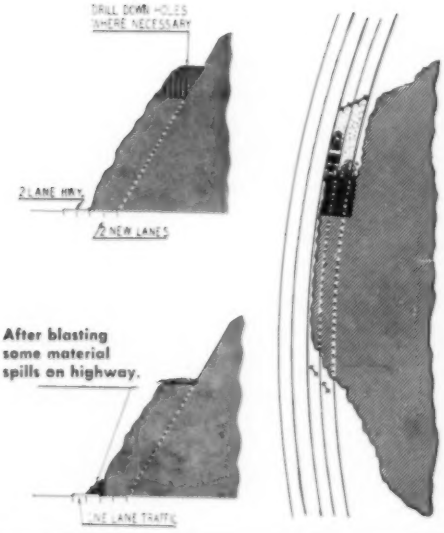
The Frank G. Hough Co., Libertyville, Ill., has announced the construction of a 55,000 sq. ft. addition to its plant. The new buildings, expected to be completed this year, will give the plant a total of 368,000 square feet, all devoted to the manufacture of tractor-shovel equipment. Hough's sales volume in 1955 was its largest in history.

Leschen Wire Rope Div., H. K. Porter Co., Inc., St. Louis, Mo., has appointed Deane Courtright as district sales representative with a territory including the states of Washington, Montana and northern and western Idaho.

LeTourneau-Westinghouse Co., Peoria, Ill., has broadened its program of certifying heavy construction equipment operators to include operators of Adams motor graders. LeTourneau-Westinghouse purchased the plant and assets of the J. D. Adams Mfg. Co. of Indianapolis, Ind., in 1955. LeTourneau-Westinghouse introduced its certification program in 1939. To be eligible for certification, an individual must have a record of capably operating LeTourneau-Westinghouse equipment, including Adams graders, for six or more months. The record must be verified in writing by the applicant's contractor-employer or former employers.

Massey-Harris-Ferguson, Inc., Racine, Wis., has established an Industrial Division to market a full line of light and medium-duty industrial wheel tractors and allied equipment.

Highway Widening Jobs Need Not Obstruct Traffic



Contractors can take highway widening jobs without building bypass roads to carry traffic.

The busy highway shown above is being widened from two lanes to four lanes using the method described at left.

The problem was solved by keeping the trucks and excavating equipment off the highway so that it remained open for traffic except at intervals when shooting was necessary.

The Eimco 105 Tractor-Excavator was ideally suited to this type of job. It loads large trucks full from the end and cleans up the big boulders quickly. With the Eimco operating in a straight line, forward to dig and load and reverse, with the bucket moving overhead, to discharge.

Digging in dirt and consolidated material can often be accomplished without blasting the material at all. The Eimco 105 will load in dirt at the rate of 10 yards per minute and in rock the rate of loading is 6-7½ yards per minute depending on the material.

Eimcos are heavy-duty machines built to handle the toughest kind of jobs. They can apply more thrust force at the digging lip than larger equipment costing several times as much.

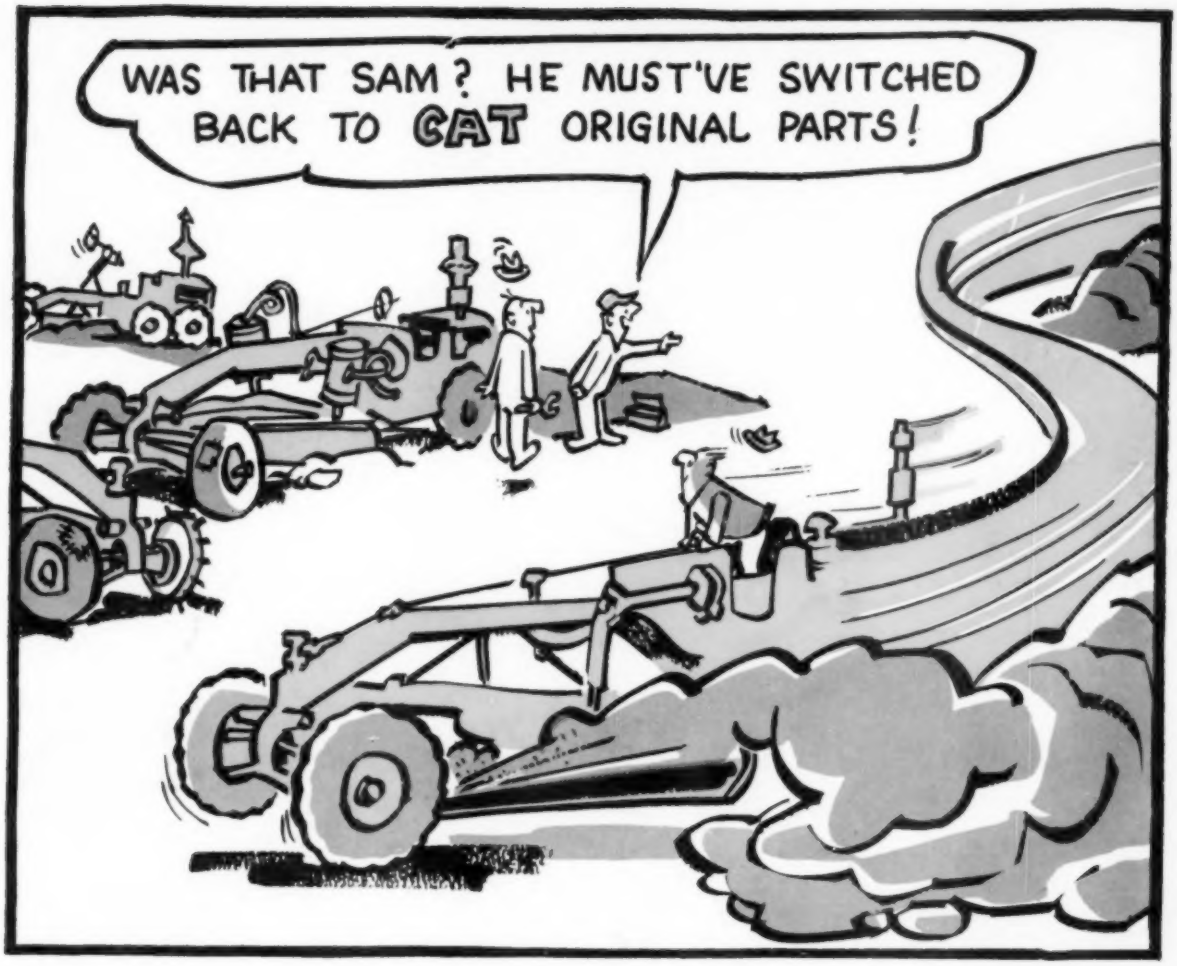
Write for complete information on Eimco 105 Tractors.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • **Export Offices: Eimco Bldg., 52 South St., New York City**

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-187



Take it from Sam. Beware of "just as good" substitutes.

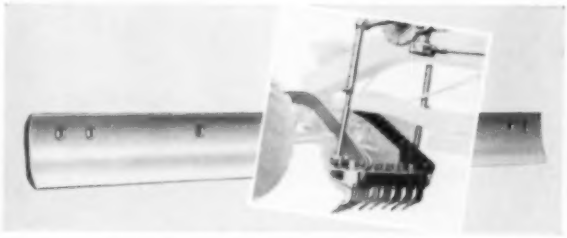
A cutting edge for your CAT* Motor Grader, for example. Caterpillar original cutting edges are made from only top-quality high-carbon steel—carefully pretested. Or scarifiers. If they're Caterpillar, the shanks are strong steel forgings mounted in a heavy cast steel block. Their replaceable teeth of forged alloy steel are selectively heat treated to resist wear.

You're sure of more dependable performance on any kind of job when you use only Cat cutting edges and scarifier teeth.

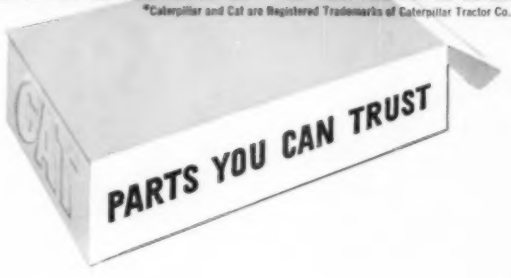
With substitute parts, can you be sure of anything?

See your dealer's Parts Representative—better get Caterpillar original parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



Cat original motor grader cutting edges and scarifier teeth are the results of never-ending metallurgical research. They match the all-around performance of the quality machines they work with.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.